CANADA

DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

DIVISION OF BOTANY AND PLANT PATHOLOGY

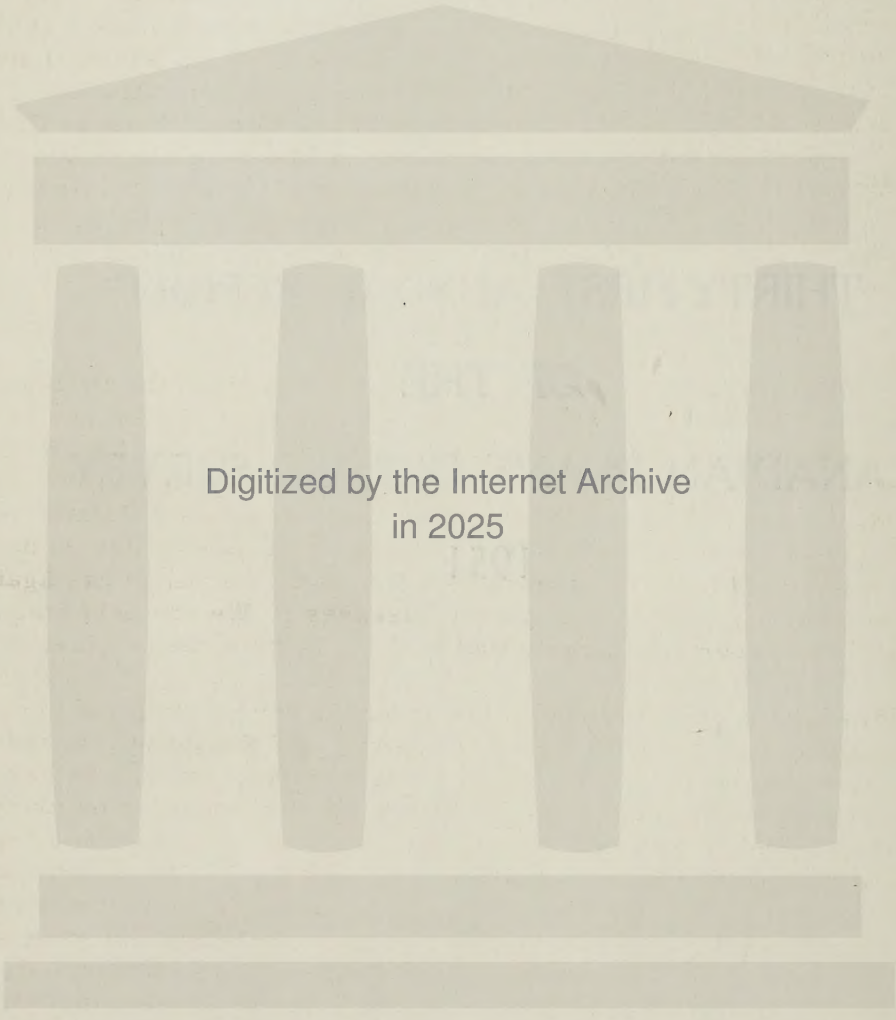
THIRTY-FIRST ANNUAL REPORT OF THE CANADIAN PLANT DISEASE SURVEY 1951

Compiled by:

I. L. CONNERS

D. B. O. SAVILE

Published by Authority of the Rt. Hon. James G. Gardiner, Minister of Agriculture,
Ottawa, 1952.



Digitized by the Internet Archive
in 2025

https://archive.org/details/canadian-plant-disease-survey_1951_31

FOREWORD

The current report follows the general pattern of previous reports in this ies. The use of abbreviations has been continued for the words trace, slight, derate and severe and the cardinal points of the compass as they are applied geographical areas within the provinces.

As in many recent reports there are several special contributions. The roductory section contains "Notes on some plant nematode problems, 1951" by D. Baker and some phenological data by R. C. Russell, W. H. Minshall and . Bassett. In the body of the report appear the following contributions: "Rust rseries in Canada in 1951" and "Physiologic Races of Cereal Rusts in Canada 1951" by T. Johnson and others; "Flax Diseases in Saskatchewan in 1951" by of. T. C. Vanterpool; "Flax Diseases in Manitoba in 1951" and "Sunflower seases in Manitoba in 1951"by W. E. Sackston; "Diseases of Soybeans in uthwestern Ontario in 1951" by A. A. Hildebrand; on tobacco diseases by L. W. ch; and "Cherry Virus Disease Survey in the Niagara Peninsula, Ont. "by R. S. llison.

Besides the contributors already mentioned, and members of the Division, we g to record our indebtedness to Mr. S. F. Clarkson; Mr. O. Caron and Mr. D. blond; Mr. F. Godbout and Mr. E. Lavallee; Dr. J. E. Jacques; Dr. B. P. erne; Prof. E. H. Garrard and Prof. C. B. Kelly; Dr. A. W. Henry; Mr. W. bey; Mr. W. R. Foster and Mr. I. C. MacSwan, and all District Potato Inspectors. r. G. C. Morgan, Division of Plant Protection has contributed notes on diseases potatoes and vegetables from Newfoundland. Dr. R. O. Lachance has again nslated the summary "New and Noteworthy Diseases." We can only emphasize t the value of these reports is largely tied to the quality of the original submissions.

Your compilers take a modest pride in the advances in reporting the various seases affecting crops in Canada, their prevalence, and the losses caused by them. ecial surveys have helped to raise the general level of reporting, whether or not e data appear in separate reports. Nevertheless the data supplied on many of e major diseases across the Dominion are of very uneven quality. Too frequently servations in some parts of the country are made quite casually without any nscious effort to collect in a systematic manner a body of information which may interpreted. Pathologists who wish to improve their techniques of assessing e intensity of plant diseases and appraising the losses caused by them will find ny useful suggestions in K. Starr Chester "Plant Disease Losses: their Appraisal d Interpretation" U. S. D. A. Pl. Dis. Reporter Suppl. 193. 1950.

I. L. Conners

D. B. O. Savile

May 1952,
vision of Botany and Plant Pathology,
ience Service,
tawa, Canada.

New or Noteworthy Diseases

Stem rust (Puccinia graminis) reached the Prairie Provinces too late in the season to cause damage in 1951. However, race 15B of wheat stem rust was the predominant race in Man. and the escape from damage was not due to any resistanc of the varieties to this race but merely to the arrival of the rust too late to cause any really heavy infection. The rusts overwintered poorly in the southern United States on account of severe winter weather. Their subsequent spread northward was delayed by an early-summer drought in the Dakotas, Minnesota and southern Man. Some stem rust developed in southern Alta., but this rust was caused by rac 56, a common race in former years throughout the spring wheat area. Rye stem rust was fairly heavy on barley at Fredericton, N. B. and occurred on this cereal at several places in Eastern Canada. Although stem rust appears rarely to over-winter in Canada, an authenticated case of overwintering of rye stem rust on Agropyron repens was observed in the spring of 1951 at Winnipeg. Leaf rust (Puccinia triticina) became heavy on wheat late in the season in northwestern Man. and adjacent eastern Sask.; it was probably heavy in Eastern Canada. Of the other cereal rusts only oat stem rust was heavy in some localities in Eastern Canada.

There was little change in the smut situation in Canada in the last year. Examination of cereal seed samples in Western Canada clearly shows that smut is all too common especially in barley and oats, although most of the smuts could be controlled by careful seed treatment. Interest has been revived in the use of chemi in the control of barley loose smut since it has been found that a long soak in a 0.2% solution of Spergon will frequently result in a clean crop.

The poor filling of the heads was the major disorder that affected and caused great damage to the wheat crop in a great area centering in Sask., but extending into both Alta. and Man. High temperatures accompanied in some areas by drought caught the crop at a critical stage of development, virtually killing the plants. The injury was frequently aggravated by common root rot and in some instances by injury from 2,4-D. Humid weather reduced the quality of the threshed grain. Because of inclement weather much of the crop was still uncut or unthreshed at the close of the season.

Evidence was secured at Winnipeg that false stripe of barley, which has been known at least since 1924 in Man. and has been recorded in several other Canadian provinces, is caused by a virus.

The possible occurrence of grey speck (manganese deficiency) of oats was recorded in Alta. for the first time. Other new records were: root necrosis (Gloeosporium bolleyi Sprague) on oats in the plots at Ottawa and leaf spot (Selenophoma donacis (Pass.) Sprague & Johnson var. stomaticola (Baeuml.) Sprague & Johnson) on Avena fatua in Sask.

Black stem (Ascochyta imperfecta) was unusually heavy on alfalfa in the Prairie Provinces, especially in seed-growing areas. Stem nematode (Ditylenchus dipsaci) was found in additional fields in southern Alta., but the infestation does not appear to be spreading in the fields and plots where it was found in 1950.

rown bud rot, which was first recognised as a distinct disease in 1950 in southern lta., was found to be quite prevalent; its etiology is still to be worked out. nthracnose (Colletotrichum viciae Dearn. & Overh.) on hairy vetch at Kentville, .S., was a new Canadian record.

The exceptionally wet season that prevailed over most of Canada except in .C. was favourable for the development and spread of many fungous diseases. otable was the occurrence of the rot of heads and necks of sunflower and safflower y Sclerotinia sclerotiorum. As the heads of sunflower are several feet above the round it hardly seems possible that the heads could become regularly infected ther than through the development of the apothecia from the sclerotia and the ischarge of ascospores. The latter have been shown to play an important part in itiating infection by S. trifoliorum in England, but they generally appear to be nimportant in S. sclerotiorum.

Rust (Puccinia helianthi) was again very destructive to sunflowers in Man. owny mildew (Plasmopara halstedii) is as yet a minor disease of sunflower in Ian., but if the observations at Ste. Anne de la Pocatière, Que., are any criterion could become very troublesome because of its long persistance in the soil. Of ne diseases of soybean, in southwestern Ont., stem canker (Diaporthe phaseolorum ar. batatis) is well established, brown stem (Cephalosporium gragatum) is widely istributed, and Pythium ultimum has been found causing a stem and root rot of oybean not previously observed. Rust (Melampsora lini) continues to be the important isease of flax in Man. and it was fairly abundant in Sask. Extremes of weather ere unfavourable for the flax crop. Helminthosporium leaf spot (H. turcicum) as epidemic for the first time on corn in southwestern Ont. and was probably a art of the larger epidemic that developed in Indiana and other corn producing States outh of the border.

A new pathogen of corn roots, first found on corn in southwestern Ont. in 1950 as recently been described by Cain as Phialophora radicicola. Other new records ere: Bunt (Tilletia pallida G. W. Fischer) balls were found in a seed sample of grostis canina from P. E. I. The pathogen is quite distinct from T. decipiens, hich is known in Canada on A. tenuis in N. S. A snow mould apparently caused y a species of Sclerotinia, at least unknown in Canada, was very destructive to nany grass hosts at Prince George, B. C.

The status quo has been maintained in combatting bacterial ring rot Corynebacterium sepedonicum) of potato. Vigilance and prompt eradication have een successful in B. C. and P. E. I. in keeping the number of ring rot cases to a few cattered fields. The provincial campaign in potato growing areas in Alta. has ept the infection at a level where losses are virtually nil and the introduction of isease-free seed of good quality has improved the industry. Least successful n the fight against ring rot is Que. where 22% of the fields entered for certification ere rejected for ring rot.

Weather conditions were especially favourable for the development of late light in most parts of Canada except B. C., and losses were heavy in the Maritime Provinces and some districts of Que. with lesser damage occurring in Ont., Man.,

and into northeastern Sask. Its absence from northern Alta. must have been due to the lack of initial inoculum. Late blight struck early and losses were almost entirely the result of reduced yields. In the Montreal district unsprayed fields were a total loss. In spite of the devastating epidemic, however, late blight could be controlled and an excellent crop harvested if the crops were kept protected. Equally significant is the fact that the average marketable yield of the plots sprayed with Bordeaux has been 40% greater than that of the unsprayed plots in the last seven years at Charlottetown, P. E. I.

A year like 1951 emphasizes the importance of the present program of breeding varieties of potato resistant to late blight and other diseases. However, it will be noticed that small amounts of late blight have been seen on the foliage of the blight-resistant varieties Canso, Keswick and Kennebec and it caused rot in the tubers at several places in Quebec and the Maritimes. Recently it has been demonstrated experimentally that there exists a race of Phytophthora infestans that is able to attack not only Green Mountain but also Canso and Keswick, previously immune to late blight infection. Late blight was also heavy on tomato at points in Eastern Canada. Moreover the organism on tomato appears to be a distinct race to which potato varieties such as Green Mountain are equally susceptible; however, the tomato is not fully susceptible to the potato races. Showing a similar distribution pattern to late blight, onion mildew (Peronospora destructor) was epidemic in e. Ont. and the Montreal district while it was almost absent in the B. C. Interior.

Further varietal trials in soils infested by wart (Synchytrium endobioticum) have shown that the mauve-blossom strain of Sebago is the only highly resistant variety so far being tested in Nfld. Other varieties that proved promising last year were only moderately resistant in the 1951 trials.

A survey of crops for Verticillium wilt carried out during the last two years in the B. C. Interior has revealed that the disease is widely distributed in the Okanagan, Thompson, and Upper Fraser Valleys. The disease was most prevalent in tomato and pepper, but was affecting potato, eggplant, cantaloupe, cucumber, squash, watermelon, and apricot. Severe damage, particularly to tomatoes, was correlated with continuous cropping. Wilt was also prevalent for the first time on strawberries in Ont.

New records of vegetable diseases were: Rust (Uromyces appendiculatus) on lima bean at Wainfleet, Ont.; leaf spot (Cercospora fabae Fautrey) on broad bean on Tancock Island, N. S.; brown spot (Cephalosporium apii Smith & Ramsay) on green pascal celery near Burlington, Ont.; white rot (Sclerotium cepivorum Berk.) garlic at Steveston, B. C.; Aphanomyces cladogamus Drechsler as one of the fungi causing damping-off of pepper in a greenhouse at Harrow, Ont. Root rot of tomato caused by Colletotrichum atramentarium, long known as a weak parasite of potato in Canada, was found in a greenhouse near Leamington, Ont. Yellows (Fusarium oxysporum f. conglutinans) was severe on cabbage in the Montreal district although not previously observed in that area.

Fire blight (Erwinia amylovora) appeared to be more widespread on apple d pear in 1951 than in recent years. The disease has been kept at a low level the B. C. Interior by winter pruning through regulations enforced by the provincial thorities. Nevertheless in the Creston Valley, pear production has declined spite increased planting, the decline being attributed to fire blight. Apple scab as moderately heavy to severe in parts of B. C. and from Ont. eastwards, but the trees were carefully sprayed a clean crop was usually harvested. Leaf otch (magnesium deficiency) was satisfactorily controlled for the first time in . C. Little leaf and rosette (zinc deficiency), already known on apple, was agnosed for the first time on pear, prune, peach and cherry in the Okanagan alley, B. C. Much of the winter killing of apricot and peach in the Kootenays ppears to be confined to trees weakened by Coryneum blight (Clasterosporium rpophilum). Sweet cherry is generally resistant to crown rot (Phytophthora actorum), an important disease of apple, but a tree of the new variety Van was ound infected at Summerland, B. C., a finding anticipated from previous inoculation ials. This new variety, which is just now coming into production in B. C., shows reat promise because its fruit appear normal when the tree is affected by the ttle cherry virus. Careful surveys conducted during the past five years in cherry rchards in the Niagara Peninsula, Ont., reveal that a high percentage of the trees re affected with one or more of the virus diseases. Yellow rust (Phragmidium ubi-idaei), formerly rarely found in commercial plantings of raspberry, except n B. C., may now occasionally be seen causing damage in Ont.

Shoot rust (Chrysomyxa woronini) was found to be not uncommon at St. Anthony, fld., on both Picea glauca and P. mariana always in association with the telial itches' brooms on Ledum groenlandicum. Finding the rust on the latter host uggests that it may yet be found further south, especially in humid forest regions, han previous observations suggested. Anthracnose (Gnomonia veneta) was xceedingly prevalent this year on Platanus at Victoria, B. C., and along the Niagara iver in Ont. The finding of rust (Puccinia coronata) on Rhamnus utilis at Morden, Man., added a new host for North America. Infection of willows by scab Fusicladium saliciperdum) and blight (Physalospora miyabeana) and of poplar by eaf and twig blight (Fusicladium radiosum) was favoured by the wet season in the Maritimes. Dutch elm disease (Ceratostomella ulmi) continues to spread slowly n Ont., the worst infection to date being in Essex Co. New Canadian records were eaf spot (Cercoseptoria crataegi (Ell. & Ev.) Davis) on Crataegus and leaf spot Gloeosporium serotinum Ell. & Ev.) on Prunus serotina, both in N. S.

Rust (Puccinia malvacearum) of hollyhock was exceptionally heavy in parts of astern Canada. Grey mould (Botrytis cinerea) was heavy on several ornamentals n Que. as a result of the wet season. Powdery mildew (?Erysiphe cichoracearum) f begonia seems to be increasing in Ont. and Que. Bacterial Blight (Pseudomonas yringae) was severe on forsythia, mock orange and lilac in N. S. Leaf spot Alternaria fasciculata Cke. & Ell.) of gladiolus was newly described from Ont. The field symptoms of gladiolus core rot (Sclerotinia draytoni) were conspicuous n Que., an unusual condition presumably associated with the wet season. It is ncreasingly evident that many gladiolus stocks are heavily infected with viruses. Decline (virus) continues to be the most serious disease of narcissus in B. C. Angular leaf spot (Septoria azaleae Vogl. ex Sacc. & Syd.) developed in a green-ouse in Ont. on azaleas imported a few months previously from Europe. Fire Botrytis tulipae) was severe on tulips in several provinces. The use of sawdust nulch, for weed control, appeared to reduce its incidence markedly in B. C., but as several disadvantages.

Maladies nouvelles ou d'importance notable.

La rouille de la tige des céréales (Puccinia graminis) est apparue trop tard dans les provinces des prairies pour causer des dommages en 1951. Toutefois, au Manitoba, la race dominante de la rouille de la tige du blé fut la race 15B, et ce n'est pas la résistance des variétés à cette race mais plutôt l'apparition trop tardive du parasite pour causer une épidémie qui a empêché des pertes de quelqu conséquence. Les rouilles ont mal hiverné dans le sud des Etats-Unis à cause des rigueurs de l'hiver. De plus, leur dissémination vers les régions nordiques a été retardée par une sécheresse au début de l'été, dans les Dakota, le Minneso et le sud du Manitoba. Il y eut un peu de rouille de la tige dans le sud de l'Albert mais dans ce cas, c'est la race 56, très répandue les années précédentes dans la région à blé de printemps, qu'on doit incriminer. La rouille de la tige du seigle fut passablement grave sur l'orge au Nouveau-Brunswick et fut en outre observée en plusieurs endroits dans l'est du Canada. Bien que la rouille de la tige hiverne selon toute apparence très rarement au Canada, on a observé à Winnipeg en 1951 un cas bien authentique de l'hivernement de la rouille de la tige du seigle sur le chiendent. La rouille des feuilles du blé (Puccinia triticina) devint grave tard dan la saison dans le nord-ouest du Manitoba et dans la partie adjacente de la Saskatchewan; il est probable qu'elle fut grave dans l'est du Canada aussi. Entre toutes les autres rouilles des céréales, seule la rouille de la tige de l'avoine fut grave dans certaines localités de l'est du Canada.

Il n'y eut que peu de changement, au cours de l'année 1951, quant aux charbo des céréales au Canada. L'analyse des échantillons de semences dans l'Ouest canadien démontrent clairement que les charbons sont, et de beaucoup, trop communs, surtout dans l'avoine et l'orge, et ceci, en dépit du fait qu'on peut faci lement enrayer ces maladies par des traitements appropriés des semences. Il y a un regain d'intérêt dans les traitements chimiques pour la lutte contre le charbo nu de l'orge depuis qu'on a trouvé qu'un bain prolongé dans une solution à 0.2% de Spergon donne fréquemment une récolte saine.

Le faible développement des épis est le principal trouble dont la récolte de bl a grandement souffert dans une vaste région dont le centre est la Saskatchewan, mais qui s'étend et au Manitoba et en Alberta. La température élevée accompagn de sécheresse, dans certaines régions, a exercé un effet désastreux sur cette céréale à un stade critique de croissance; dans bien des cas, les plants sont mort La pourriture commune des racines et dans certains cas, la toxicité du 2,4-D ont fréquemment contribué à aggraver la situation. L'humidité relative élevée a dimi la qualité du grain. De plus, à cause de la température inclémente, une partie de la récolte était encore sur pied ou non battue lorsque vint l'hiver.

On a acquis la preuve à Winnipeg que la fausse rayure de l'orge, une maladie qu'on connaît depuis 1924 au Manitoba et qu'on a observée depuis dans plusieurs autres provinces du Canada, est causée par un virus.

On soupçonne pour la première fois en Alberta la présence de la tache grise de l'avoine (carence de manganèse). Les nouvelles maladies des céréales observ

ette année sont la nécrose des racines (Gloeosporium bolleyi Sprague) sur l'avoine ans les parcelles à Ottawa et la tache des feuilles (Selenophoma donacis (Pass.) prague et Johnson var. stomaticola (Baeuml.) Sprague et Johnson) sur Avena fatua n Saskatchewan.

L'anthracnose (Ascochyta imperfecta) de la luzerne fut particulièrement grave ans les provinces des prairies, surtout dans les régions de production de graines. Le nématode de la tige (Ditylenchus dipsaci) fut observé dans quelques autres champs dans le sud de l'Alberta, mais l'infestation ne semble pas se propager ans les champs et les parcelles où il fut observé en 1950. La pourriture des ourgeons, identifiée pour la première fois comme maladie bien distincte dans e sud de l'Alberta en 1950 est très répandue; toutefois, il reste encore à en déter- niner la cause. L'anthracnose de la vesce velue (Colletotrichum viciae Dearn. & Overh.) observée à Kentville, N. E., constitue une nouvelle mention pour le Canada.

La saison très pluvieuse dont tout le Canada sauf la Colombie Britannique a été gratifié fut très favorable au développement et à la dissémination de plusieurs ma- adies cryptogamiques. Sont dignes de mention la pourriture des inflorescences et es pédoncules du tournesol et du carthame due au Sclerotinia sclerotiorum. Comme les fleurs du tournesol sont à plusieurs pieds du sol, il paraît à peine ossible que l'inflorescence puisse s'infecter autrement que par la production l'apothèces à partir des sclérotes et la libération avec expulsion des ascospores. On sait que ce processus joue un rôle important dans l'infection primaire du trèfle ar S. trifoliorum, en Angleterre, mais il semble que tel ne soit pas généralement e cas pour S. sclerotiorum.

La rouille du tournesol (Puccinia helianthi) fut encore une fois très destructive au Manitoba. Le mildiou du tournesol (Plasmopara halstedii) n'a encore que peu l'importance au Manitoba, mais si les observations faites à Sainte-Anne-de-la- Pocatière, Qué., peuvent servir de critère, il pourrait devenir très grave à cause de la persistance du pathogène dans le sol. Des observations faites sur la fève soya, il faut conclure que le chancre de la tige (Diaporthe phaseolorum var. batatis) est très bien établie et que la tige brune (Cephalosporium gregatum) est très répan- due. De plus, le Pythium ultimum a causé une pourriture de la tige et des racines qui n'avait pas été observée jusqu'à date. La rouille du lin (Melampsora lini) est toujours une maladie importante au Manitoba et elle était passablement répandue en Saskatchewan. Les températures extrêmes de la saison dernière furent défa- vorables à la récolte de lin. La tache helminthosporienne des feuilles (Helminthosporium turcicum) du maïs prit une allure épidémique pour la première fois dans le sud-ouest de l'Ontario. Cette épidémie est probablement partie de celle beaucoup plus considérable qui s'est développée dans l'Indiana et dans les autres Etats américains producteurs de maïs.

Cain a décrit un nouveau pathogène des racines du maïs (Phialophora radicicola), qui avait été observé en 1950 dans le sud-ouest de l'Ontario. Voici quelques nou- velles additions: la carie (Tilletia pallida G. W. Fischer) fut observée dans un échan- tillon de graine d'Agrostis canina provenant de l'Ile du Prince-Edouard. Ce patho- gène est bien différent de T. decipiens que l'on connaît au Canada sur A. tenuis en Nouvelle-Ecosse. Une moisissure hivernale apparemment due à une espèce de Sclerotinia, inconnue au moins au Canada, s'est avérée très destructrice chez plu- sieurs graminées à Prince George, C. B.

Le statu quo n'a pas changé quant à la lutte contre la pourriture du cerne (flétrissure bactérienne) des pommes de terre. La vigilance et l'éradication ont permis en Colombie Britannique et dans l'Ile du Prince Edouard de maintenir le nombre de cas de pourriture du cerne à quelques champs isolés. La campagne provinciale menée en Alberta dans les régions productrices de pommes de terre a eu pour effet de maintenir le pourcentage à un niveau où les pertes sont insignifiantes, et l'effet indirect de l'introduction de semences exemptes de maladie a été d'améliorer sensiblement cette culture. La province de Québec a eu moins de succès dans la lutte contre cette maladie puisque 22% des champs éligibles à la certification furent rejetés à cause de la pourriture du cerne.

Les conditions atmosphériques furent particulièrement favorables au développement du mildiou des pommes de terre, sauf en Colombie Britannique. En fait, les pertes furent considérables dans les Maritimes et dans certains districts du Québec et moindres en Ontario, au Manitoba, et dans le nord-est de la Saskatchew Le nord de l'Alberta fut épargné probablement à cause du manque d'inoculum. Le mildiou apparut très tôt, et les dommages sont dus principalement à une réduction des rendements. Dans la région de Montréal, dans les champs non arrosés, ce fut une perte totale. En dépit de cette épidémie destructrice, dans les champs bien protégés, il a été possible de prévenir le mildiou et d'obtenir une excellente récolte. De plus, le fait que le rendement marchand moyen de parcelles arrosées à la bouillie bordelaise au cours des sept dernières années dans l'Ile du Prince-Edouard a été de 40% supérieur à celui des parcelles témoins non arrosées nous paraît très significatif.

Une année comme celle de 1951 met en lumière l'importance du présent programme d'hybridation de pommes de terre résistantes au mildiou et aux autres maladies. Toutefois, on doit remarquer qu'on a vu un peu de mildiou sur le feuillage des variétés résistantes Canso, Keswick et Kennebec, de même que de la pourriture des tubercules à plusieurs endroits du Québec et des Maritimes. Récemment, on a prouvé expérimentalement qu'il existe une race de Phytophthora infestans capable d'attaquer non seulement la Montagne Verte, mais aussi la Canso et la Keswick, autrefois immunes. Le mildiou fut tout aussi grave sur les tomate à plusieurs endroits dans l'est du Canada. De plus, l'organisme qui s'attaque aux tomates semble être une race distincte à laquelle des variétés de pommes de terre comme la Montagne Verte sont susceptibles; toutefois, la tomate n'est pas complètement susceptible aux races qui affectent les pommes de terre. Le mildiou de l'oignon a montré les mêmes tendances quant à sa distribution que le mildiou des pommes de terre; on a observé des épidémies en Ontario et dans la région de Montréal, alors qu'il était pratiquement absent dans l'intérieur de la Colombie-Britannique.

D'autres essais de variétés dans les sols affectés de galles verruqueuses (Synchytrium endobioticum) ont démontré que, de toutes les variétés testées jusqu'à date à Terreneuve, seule la lignée à fleur mauve de la Sebago est très résistante. D'autres variétés qui semblaient prometteuses l'an dernier ne furent que modérément résistantes au cours des essais de 1951.

Une enquête sur la flétrissure verticillienne menée au cours des deux dernières années dans l'intérieur de la Colombie-Britannique a révélé que cette maladie est très répandue dans les vallées de l'Okanagan, de Thomson et du Fraser supérieur; la maladie fut particulièrement grave sur les tomates et le piment, mais elle attaqua aussi les pommes de terre, les aubergines, les concombres, les cantaloupes, les citrouilles, les melons d'eau et les abricotiers. Les dommages ont été particulièrement graves sur les tomates lorsqu'elles étaient cultivées d'année en année sur le même terrain. Cette flétrissure était aussi assez répandue en Ontario pour la première année sur les fraisiers.

Les maladies nouvelles des végétaux sont les suivantes: la rouille des haricots (Uromyces appendiculatus) sur la fève de lima à Wainfleet, Ont.; la tache des feuilles de la gourgane, (Cercospora fabae Fautrey) à Tancock Island, N. E.; la brune du céleri (Cephalosporium apii Smith & Ramsay) sur le céleri vert Pascal, près de Burlington, Ont.; la tache blanche de l'ail (Sclerotium cepivorum Berk.) à Steveston, C. B.; Aphanomyces cladogamus Dreschsler, un des champignons responsables de la fonte des semis du piment dans une serre à Harrow, Ont. La pourriture des racines des tomates causée par Colletotrichum atramentarium, connu depuis longtemps au Canada comme un parasite faible de la pomme de terre, fut trouvé dans une serre près de Leamington, Ont. La jaunissure (Fusarium oxysporum f. conglutinans) fut grave sur les choux dans la région de Montréal, bien qu'elle n'ait pas été observée auparavant dans ce district.

La brûlure bactérienne (Erwinia amylovora) fut apparemment plus répandue sur les pommiers et les poiriers en 1951 qu'au cours des années précédentes. On l'a tenue en échec assez bien en Colombie Britannique par la taille hivernale grâce aux règlements coercitifs provinciaux. Cependant, dans la vallée de Creston, la production des poires a décliné en dépit des plantations accrues, et on attribue cette diminution à la brûlure bactérienne. La tavelure fut plus ou moins grave dans certaines régions de la Colombie Britannique et dans l'est du Canada, mais lorsque les vergers étaient bien arrosés, on a généralement obtenu une récolte saine.

La tache des feuilles (carence de magnésium) a pu être enrayée avec succès pour la première fois en Colombie Britannique. La petite feuille et la rosette (carence de zinc), qu'on avait déjà observée sur le pommier, fut diagnostiquée pour la première fois sur le poirier, le prunier, le pêcher et le cerisier dans la Vallée de l'Okanagan, C. B. La majeure partie de la gelivure de l'abricotier et du pêcher dans les Kootenay s'est produite sur des arbres déjà affaiblis par la brûlure corynéum (Clasterosporium carpophilum). Le cerisier de France est en général résistant à la pourriture de la couronne (Phytophthora cactorum), maladie importante du pommier; toutefois, un arbre de la nouvelle variété Van était infecté à Summerland, C. B. Des essais d'inoculation faits précédemment laissaient anticiper ce résultat. Cette nouvelle variété, qui commence à produire en Colombie-Britannique, est très prometteuse parce que ses fruits restent normaux lorsque l'arbre est porteur du virus de la petite cerise.

Des enquêtes minutieuses menées au cours des cinq dernières années dans le vergers de cerisiers de la Péninsule du Niagara, Ont., montrent qu'un fort pourcentage des arbres sont atteints d'une ou de plusieurs des maladies à virus spécifiques à cette plante. La rouille jaune (Phragmidium rubi-idaei), qu'on ne trouvait que rarement jadis dans les plantations commerciales de framboisiers, sauf en Colombie Britannique, cause maintenant des dégâts dans quelques plantations en Ontario.

La rouille des rameaux (Chrysomyxa woronini) a été assez fréquemment aperçue à Saint-Anthony, Terreneuve, et sur Picea glauca et sur P. mariana, mais toujours en association avec le balai de sorcière du Ledum groenlandicum où l'on voit des télies. Que l'on trouve cette rouille sur le L. groenlandicum permet de supposer qu'on pourra la rencontrer sur les Picea plus au sud que les observations précédentes ne le laissaient prévoir.

L'anthracnose du platane (Gnomonia veneta) était très répandue cette année à Victoria, C.B., et le long de la rivière Niagara, Ont. La découverte de la roui couronnée de l'avoine (Puccinia coronata) sur Rhamnus utilis à Morden, Manitoba, augmente d'une unité les hôtes de ce champignon en Amérique du Nord. La saison humide dans les Maritimes a favorisé la gale (Fusicladium saliciperdum) et la brûlure (Physalospora miyabeana) du saule, de même que la brûlure des feuilles et des brindilles du peuplier (Fusicladium radiosum). La maladie hollandaise de l'orme (Ceratostomella ulmi) continue de se propager lentement en Ontario; l'épidémie la plus grave est située dans le comté d'Essex. Les nouvelles observations pour le Canada sont la tache des feuilles (Cercospora crataegi (Ell. et Ev. Davis) sur Crataegus et la tache des feuilles (Gloeosporium serotinum Ell. & Ev.) sur Prunus serotina, toutes deux en Nouvelle-Ecosse.

La rouille des passeroses (Puccinia malvacearum) fut particulièrement grave dans certaines parties de l'est du Canada. La moisissure grise (Botrytis cinerea) fut en général très grave sur plusieurs plantes ornementales dans le Québec à cause de la saison pluvieuse. Le blanc (Erysiphe cichoracearum) du begonia tend apparemment à augmenter en Ontario et dans Québec. La brûlure bactérienne (Pseudomonas syringae) fut grave sur les forsythias, les philadelphus et les lilas en Nouvelle-Ecosse. On a décrit une nouvelle tache des feuilles du glaïeul (Alternaria fasciculata Cke & Ell.) observée en Ontario. Les symptômes de la pourriture sclérotique du glaïeul (Sclerotinia draytoni) furent très visibles en pleine terre dans le Québec; ceci est plutôt rare et probablement attribuable à la saison pluvieuse. Il est évident qu'une bonne partie des glaïeuls sont infectés de virus. Le déclin (virus) est toujours la plus importante maladie des narcisses en Colombie Britannique. La tache anguleuse des feuilles de l'azalée (Septoria azaleae Vogl. ex. Sacc & Syd.) s'est développée dans une serre de l'Ontario sur des plants importés d'Europe quelques mois auparavant. Le feu des tulipes (Botrytis tulipae) fut grave dans plusieurs provinces; l'utilisation de paillis de sciure de bois pour combattre les mauvaises herbes a apparemment diminué l'infection, mais cette pratique comporte plusieurs désavantages.

The Weather and its Influence on Diseases

The season on Vancouver Island, B.C., was characterized by abnormally dry weather from June to August. Rainfall at Saanichton was 0.07 in. (av. 1.09 in.) and sunshine the highest on record. The drought included 52 consecutive rainless days ending on 27 Aug. The weather was mild and wet in January and February, cold in early March, and warm and dry in April. The cold weather in March caused some injury to strawberries and to the foliage of bulbous iris. The common foliage diseases were all virtually absent because of the drought, but blossom-end rot of tomato and internal necrosis of potato tubers were abnormally prevalent. Harvesting weather was satisfactory, but some Pythium soft rot was seen in potatoes dug during the warm period (W. Jones).

On the mainland coast the winter was approximately normal, but there was heavy frost in mid April. The summer was abnormally dry. The April frost damaged strawberry and blueberry plants. The drought reduced fruit and potato crops, but foliar diseases were markedly absent. For the second successive year there was no loss from potato late blight (R. E. Fitzpatrick).

In the lower mainland 16 in. of snow in March delayed spring growth and work on the land. The exceptionally dry summer greatly reduced the incidence in the Fraser Valley of foliage diseases such as peach leaf curl, raspberry yellow rust, apple scab and powdery mildew, cherry shot hole, and brown rot of stone fruits. There were no reports of early and late blights of celery or early and late blights of tomato. Strawberry red stele, plum black knot, Godronia canker of blueberry, Club root of crucifers, apple anthracnose, sclerotinia wilt of pole bean, and Coryneum blight of peach gave considerable trouble (I. C. MacSwan).

In the Kootenays low temperatures in January killed all apricot fruit buds and killed or damaged many peach trees weakened by Coryneum cankers. Healthy peach trees were unharmed. Heavy frosts at the opening of cherry bloom and the early pre-pink stage of apple buds reduced the cherry crop severely and the apple crop moderately, in Creston Valley. Wet fall weather in 1950 caused severe Coryneum canker of peach, and wet weather at husk fall allowed heavy fruit infection. Showers from 27 April to 2 May, 10-17 May (blossom period), 2-5 June and 11 June stimulated apple scab infection; but the summer from then on was dry (the only heavy rains being 10-12 July and 11 Aug.), which reduced scab infection. Intermittently wet weather from late August allowed heavy pin-point scab. The wet spring caused abundant blossom and twig infection of pear, where fire blight pruning was inadequate, but the dry summer checked spread. The dry weather also reduced brown rot incidence in the cherry crop (M.F. Welsh).

The heavier than usual snowfall in Alta., which melted during late March, made the soil excessively wet and delayed the planting of crops in most areas. Rainfall was much above normal in nearly all regions during the growing season. As a result of this high moisture, and low temperatures during April, June, and July, most crops were backward at every stage of development. In general, foliage diseases of nearly all crops were more prevalent than usual, including scald and speckled leaf blotch of barley, halo blight of oats, leaf rust and glume blotch of wheat.

In spite of the weather, very heavy yields of nearly all crops were common. However, the frequent rains and early frost and snow in certain areas during September and October made harvesting very difficult, with damage to both yield and grade. Many acres of potatoes were frozen in the ground (F. R. Davidson).

At Saskatoon, Sask., the mean temperature was 3°F. above average in May, 3° below in June, and 1° below in July, August and September. Rainfall was substantially above average in June and July, and rain fell on 56 days of the 5 months. In general the summer was cool with low evaporation. Sunshine was high in May and June, low in August and average in July and September. During the one important hot spell, 22-28 July, the maximum was 80-87° F. Coming abruptly after cool, wet weather this moderately hot weather damaged crops markedly and contributed largely to the poor filling of wheat. Black mould on cereal crops was the worst for at least 24 years (T. C. Vanterpool). Growing conditions in early May were good in Sask., with high temperatures and abundant moisture, but late in the month the soil was dry and strong winds caused drifting. These conditions, together with delayed seeding owing to spring harvesting caused slow growth and poor germination in some areas. June and July were cool and rainfall irregular. Grain crops headed about 7-10 days late. Frost occurred in mid-August in some northern areas. Moist weather late in the season delayed ripening, favoured leaf diseases and head discolorations and delayed harvest. Much grain sprouted in the swath or was harvested damp (R. C. Russell).

Temperature and precipitation in the Niagara Peninsula, Ont., during the winter were favourable for orchard fruits. Heavy precipitation in March (3.30 in. and again in April (3.67 in.) hampered the application of dormant sprays. Peach leaf curl was important in orchards where inadequate drainage delayed the dormant spray beyond the critical infection period of 9-16 April. In this period frequent showers, totalling 2.01 in., were recorded at St. Catharines. In some orchards not sprayed before this wet spell, the disease was epidemic. In poorly drained areas the wet ground contributed to the occurrence of crown injury and the death of young peach, plum, and cherry trees. It also stimulated the development of Verticillium wilt, which was prevalent in mid summer.

Apple scab was epidemic in many orchards. Initial ascospore discharge was recorded on 12 April before bud break. Favourable infection conditions occurred 22-25 and 28-29 April. The latter period, with a mean temperature of 54.7° F., was particularly serious and no doubt resulted in much of the primary infection first observed 12 May. Rains on 11-12 and 27-28 May stimulated abundant secondary infection. Five well-marked infection periods occurred in June, and by the end of the month scab was rampant on unsprayed trees. Little further spread of the disease occurred in orchards where earlier control measures were effective. The rains of 11-12 May were important in initiating blossom blight of cherry and providing abundant inoculum for brown rot of the mature fruit. Showery weather in late June induced fruit rot and careful grading was necessary. Brown rot affected the mid-season peaches to some extent but was generally of little importance. Weather conditions during harvest of the later varieties did not favour the disease.

A moderate outbreak of downy mildew of grapes was favoured by showery weather during the bloom period, 13-14 June, of the susceptible Fredonia and President varieties.

Late blight of tomatoes was destructive in early August, but warmer, dry weather checked its widespread development. Similarly there was little tuber infection of potatoes in spite of heavy foliage infection in mid summer (G. C. Chamberlain).

At Ottawa, January to April, inclusive, were mild, cloudy and rainy. Snowfall was close to average, but because of rain and mild weather snow cover was generally light. A single very cold spell in early February (min. -33° F.) apparently caused no appreciable damage. May was warm, dry and sunny, but June, July and August were cool and cloudy. Rainfall was actually somewhat below average, but was evenly distributed and there were few heavy showers with extensive run-off. The highest temperature recorded was 88° F. The ground was wet enough to limit seriously the growth of corn. The only rainless period of any importance was 22-30 July, inclusive, with daily maxima from 78 to 88° F. The humid weather favoured late blight of potato and tomato and a variety of leaf-spotting fungi; but the ubiquitous powdery mildew of phlox was less conspicuous than usual. The moist cool summer was unusually favourable for the development of a great variety of early and mid season mushrooms. Following 1.57 in. of rain on 6 Sept., the weather improved, and most of September and October were warm and dry, providing good harvesting conditions for late crops. Heavy snow fell in early November. Although this snow all melted, further light falls occurred near the end of the month. Heavy snow after mid December left a cover of about 18 in. at the end of the year (D. B. O. Savile).

The abundant snow cover that accumulated till the end of March, at Ste. Anne de la Pocatière, Que., disappeared rapidly during April following prolonged rains.

Dry, cool conditions prevailed in May and June, checking fungus diseases but allowing good growth of flowering plants. Aecial stages of rusts were very scarce. July and August were characterized by alternating short periods of rain and sunshine. Only traces of most diseases were observed; most crops were healthier than usual. Mushrooms were exceptionally abundant in protected places. September was very cool and moderately rainy. A few plant diseases, including apple scab, late blight and grey mould on strawberry, Pelargonium and Zinnia, became epidemic. October was favourable for the harvest of late crops (A. Payette).

The year opened at Fredericton, N. B., with 6 in. of frost in the ground under a very light snow cover. During January 26 in. snow fell, but heavy rain reduced the depth to 6 in. February was mild, but with the lowest sunshine (66 hours) ever recorded. Despite 29 in. snow, heavy rain left the fields bare from 7 to 23 Feb. March was also mild and cloudy. Despite heavy snow early in the month, over 1.5 in. of rain left the fields bare by the 15th. In April rain fell on 21 days, totalling 5.17 in. The mean temperature was 4° above average but the 85 hours of sunshine was the lowest on record. The frost was out of the ground by 24 April and, with warm, sunny weather during the last week of the month, the land dried out rapidly.

Light showers on 7 May and rainstorms on 11 and 12 May caused heavy discharges of apple scab ascospores. Fine weather during 13-23 May permitted seeding on well-drained land, but the last week of the month was very wet. Meadows made excellent growth. From 1 to 8 June 1.25 in. rain fell, but a dry spell from 9-22 June allowed about half the grain to be sown before further wet weather set in. Rain totalling 6.6 in. fell on 16 days in July, August was also wet and cloudy, with 4.4 in. rain falling on 12 days. The weather made haying difficult, caused lodging of early oats and barley, and induced the most severe epidemic of potato late blight for 25 years. September and most of October were warm and sunny and harvesting conditions were good. Heavy snow fell on 28 Oct. but quickly melted. Nearly 5 in. rain and 15 in. snow fell in November. Ploughir ceased on 22 Nov. and the St. John River froze over on 28 Nov.; but very mild weather in early December caused the river to reopen and it refroze on 14 Dec. Snowfall totalled 51 in. during December and snow cover was 8 in. at the end of th month (J. L. Howatt).

April and May were wet in N. S. and the early part of the growing season warr than average. Early June was wet, which, with heavy rain in late May caused hea apple scab infections throughout the Annapolis Valley. The rest of June was dry. The rainfall in July was normal and evenly distributed; it was sufficient to allow potato late blight to spread slowly from seed-piece infection. Temperatures were normal in August but rainfall was high and occurred on 17 days. Late blight rapid became epidemic, especially in some coastal areas where all but resistant varieti rotted in the ground before harvest. Foliage diseases generally became abundant. September was warm with normal rainfall and late blight was checked. October was dry with normal temperatures (J. F. Hockey).

May was fine in P. E. I. and an unusual acreage of potatoes was planted early; but heavy, prolonged rains and cool weather in June caused many stands to be poor due to seed-piece decay. Orchards could not be adequately sprayed during this we weather and apple scab became heavy. Willow blight also reappeared after many years of quiescence. Rain on 16 days in July, together with fogs and heavy dews, caused potato late blight to become serious by mid August, and apple scab caused heavy losses. Greatly improved weather in September and October allowed adequate spraying of potatoes and made harvesting simple. Some late-harvested potatoes broke down from field frost (R. R. Hurst).

Notes on Some Plant Nematode Problems, 1951

A. D. Baker

The oat nematode, Heterodera avenae, which has an interrupted range between Waterloo and Peterborough in southern Ontario, caused injury in 1951 somewhat below the average, but this important pest of oats, barley, and some other cereals continues to spread slowly. However, the present range is not altogether clear because of the lack of recent surveys. A fungous parasite of this nematode was observed near Conestogo, Ont., in June, 1951. Although this nematode obviously has some natural enemies it causes very considerable crop loss from time to time and warrants greater attention than it has received.

In the Blackwell area of Ontario, infestations of the sugarbeet nematode, Heterodera schachtii, have increased during the past two years although there is no evidence of spread beyond the regions previously reported infested. The main reason for the rise in populations is probably the lack of sufficient attention to the introduction of suitable crop rotations since the removal of all other restrictions in this area a few years ago. The danger of spread of this pest from the Blackwell area may be said to have greatly increased and should be a matter of concern. Our studies on chemical and cultural control have shown that the populations of these nematodes can be greatly reduced but not eradicated. In the Canadian Insect Pest Review 29 (7): 247-250. 1951), R. H. Mulvey gives a summary of the records of host plants obtained for this pest at Blackwell. Besides sugar beets, these are: mangel; garden beet, cabbage; cauliflower, kohlrabi; broccoli; kale; Brussels sprouts; rape; rutabaga; turnip; radish; garden cress; spinach; sweet alyssum, Alyssum maritimum; sweet william, Dianthus barbatus; love-lies-bleeding, Amaranthus melancholicus; portulaca, Portulaca grandiflora, candytuft, Iberis amara; dianthus, Dianthus; curled dock, Rumex crispus; shepherd's-purse, Capsella bursa-pastoris; wormseed mustard, Erysium cheiranthoides; charlock or wild mustard, Brassica arvensis; purslane, Portulaca oleracea; oak-leaved goosefoot, Chenopodium glaucum; and rhubarb, Rheum rhaponticum. The identification of this nematode from Chenopodium glaucum points to the possibility of some confusion between this plant and lamb's-quarters, C. album, in other records of host plants. At Blackwell viable cysts have also been recovered from wallflower, Cheiranthus cheiri, but the identification of the nematode species involved is not yet certain.

The potato-rot nematode, Ditylenchus destructor, did not cause any appreciable crop injury in Prince Edward Island in 1951 and infestations have declined although much of the decline is probably due to the removal of all infested land from potato production. However, in any reference to areas of infested land on the Island it should be borne in mind that most of the land termed infested has never shown more than light infestations and the presence of even one infested potato tuber has been sufficient to cause a whole field to be classified as infested. During the past two years a number of the infested fields have been treated with fumigants, but these fields are not yet back in potato production. In a current issue of the Canadian Insect Pest Review (Vol. 30, 1952), V. Henderson has brought together our records of host plants obtained in Prince Edward Island. These studies have been particularly

difficult as the range of taxonomic characters of this species appear to be rather wider than had previously been assumed and the possibility of other, undescribed species being present has always had to be considered. In addition, differences i degree and type of invasion in different plant species have been revealed so that in some cases the plant may be harbouring or sheltering the nematode without functioning as a true host plant. Besides the potato, host plants listed by Henders include field mint, Mentha arvensis; red clover, Trifolium pratense; alsike clove hybridum; onion, Allium cepa; and blue-eyed grass, Sisyrinchium angustifoliu and records presently classified as tentative are common vetch, Vicia sativa; mouse-ear hawkweed, Hieracium pilosella; butter-and-eggs, Linaria vulgaris; silvery cinquefoil, Potentilla argentea; sheep sorrel, Rumex acetosella; yellow hop clover, Trifolium agrarium; perennial sowthistle, Sonchus arvensis; and com dandelion, Taraxacum officinale.

The name Pratylenchus pratensis (de Man, 1880) Filipjev, 1936, has been used for the meadow nematodes but they have been increasingly recognized as a complex including several undescribed species However, a redescription of P. pratensis by Thorne has now enabled us to use this name in a somewhat more restricted sense. If Thorne's restricted designation is used the form or forms previously reported as attacking peaches and tobacco at Harrow, Ont., are not P. pratensis. Their exact identification will require further study as many of the descriptions of species belonging to this genus are so inadequate that some revisions will be necessary.

Other records include a species of root-knot nematode, Meloidogyne hapla Chitwood, 1949, from astilbe roots, Port Burwell, Ont.; Aphelenchus avenae Bastian, 1865, from potato tubers and daisy roots, York, P. E. I.; Aphelenchoides parietinus (Bastian, 1865) Steiner, 1932, from potato tubers, Miscouche, P. E. I.; and Diplogaster sp. from seeds of Pinus nigra Arnold var. cebennensis (Gren. & Godr.) Rehder, Angus, Ont.

It is hoped that it may be possible to give more and more attention to the free-living nematode populations of soils in Canada. In soils supporting plant growth these nematodes are very numerous, with populations of many millions to the acre. These soil inhabitants have been largely ignored, certainly in Canad and probably the majority of species to be found in our soils have yet to be named and described. In referring tosuch nematode populations in the soils of the U. S. A. Dr. G. Steiner (U S. D. A. Pl. Dis. Reporter Suppl. 195, 1950, p. 467), voices the need for study of these forms very accurately when he says, "Soil science cannot afford to further ignore this component of soil life. It would appear that our prese day conception of the biotic complex in the soil is at least largely incomplete if not erroneous through the one-sided consideration of only earthworms, bacteria, fungi and noxious insects". In 1914 the late N. A. Cobb (Trans. Am. Micros. Soc. Vol. 33. 1914) named and described two species of free-living nematodes from "fresh water ponds, Cape Breton Island, Canada". These were Oncholaimus punctatus Cobb, 1914, and Chromadora canadensis (Cobb, 1914) W. Schneider, 1924. The very meagre knowledge of free-living nematodes in Canada is almost entirely derived from incidental collecting by a few visiting nematologists. Species that have been recently recorded from this laboratory in the Canadian Insect Pest

Review (Vol. 29, No. 7) include records by R. H. Mulvey of Boleodorus thylactus Thorne, 1941, from clover soil, Blackwell, Ont., and Tripyla affinis de Man, 1880, from near a drainage ditch, Blackwell, Ont. In the same publication the writer has recorded Aporcelaimus americanus Thorne & Swanger, 1936, from tobacco soil Harrow, Ont.; A. vorax Thorne & Swanger, 1936, from apple orchard soil, Kentville, N.S.; Dorylaimus bastiani Buetschli, 1873, from meadow soil, Little York, P.E.I.; Dorylaimus intermedius de Man, 1880, from oat soil, Little York, P.E.I.; Mononchus (Mononchus) papillatus (Bastian, 1865) Cobb, 1916, from meadow soil, northeast of Norton, N.B.; and Xiphinema americanum Cobb, 1913, from lawn soil and from lakeshore sod, Sunnydale, Ogden Co., Que. It will be noted that this list includes some important species of predacious nematodes.

Phenological Data - 1951

Records for the 1951 season were made by B. Peturson at Winnipeg, R.C. Russell at Saskatoon and S.G. Fushtey at Edmonton. Native plants at all three places flowered fairly close to the normal date throughout most of the season except for a distinct lag at the beginning of the season at Saskatoon and Edmonton.

Wheat was sown very late at Winnipeg and Saskatoon but on about the usual date at Edmonton. At Winnipeg wheat developed and ripened so rapidly that it was mature at about the average date. At Saskatoon and Edmonton ripening was held up by cool, rainy weather and the crop was about two weeks late in maturing at both places (R.C. Russell).

Anthesis dates at London, Ont., (no previous records) were as follows:-

Acer saccharinum	30/3	Pinus sylvestris	21/5
Ulmus americana	14/4	Juglans nigra	26/5
Acer negundo	30/4	Catalpa speciosa	23/6
Quercus rubra	17/5	Tilia americana	5/7

(W.H. Minshall)

Anthesis dates at Ottawa, with number of days departure from average, for 8 plants from the main list were as follows:-

Populus tremuloides	20/4	3L	Anemone canadensis	26/5	10E
Acer negundo	1/5	2L	Bromus inermis	18/6	1E
Prunus pensylvanica	9/5	6E	Phleum pratense	24/6	1E
Smilacina stellata	22/5	2L	Solidago canadensis	3/7	2L

Anthesis dates for marker plants at Ottawa, with the number of days departu from average, were as follows:-

Acer saccharinum	7/4	5E	Carya cordiformis	9/6	5E
Ulmus americana	26/4	N	Tilia americana	8/7	2L
*Acer saccharum	--		Hamamelis virginiana	24/9	2E
Pinus sylvestris	24/5	5E			

* The marker plant did not flower in 1951 (I. J. Bassett).

SUMMARY OF PHENOLOGICAL DATA TAKEN AT WINNIPEG, SASKATOON, and EDMONTON, in 1951

Species	Winnipeg		Saskatoon		Edmonton	
Pulsatilla ludoviciana	--	--	24/4	6 L	--	--
Populus tremuloides	28/4	2 L	28/4	4 L	4/5	9 L
Phlox hoodii	--	--	4/5	7 L	--	--
Salix petiolaris	--	--	5/5	N	--	--
Acer negundo	6/5	1 E	6/5	1 E	5/5	3 L
Betula papyrifera	--	--	12/5	2 L	8/5	1 E
Thermopsis rhombifolia	--	--	14/5	3 L	--	--
Prunus americana	14/5	N	--	--	--	--
Amelanchier alnifolia	16/5	1 E	12/5	2 E	16/5	N
Viola rugulosa	--	--	19/5	2 E	19/5	2 E
Prunus pensylvanica	--	--	17/5	3 E	16/5	5 E
Smilacina stellata	--	--	21/5	3 E	1/6	4 L
Prunus sp. (chokecherry)	24/5	1 E	22/5	5 E	30/5	3 L
Crataegus sp. (hawthorn)	22/5	1 E	26/5	2 E	29/5	2 E
Cornus sp. (dogwood)	--	--	26/5	4 E	1/6	N
Viburnum lentago	29/5	6 E	--	--	--	--
Eleagnus commutata	--	--	8/6	4 L	6/6	1 L
Lonicera glaucescens	--	--	12/6	4 L	11/6	3 L
Viburnum pubescens	9/6	1 E	--	--	--	--
Achillea lanulosa	--	--	10/6	N	29/6	3 L
Diholcos bisulcatus	--	--	13/6	3 L	--	--
Anemone canadensis	--	--	13/6	3 L	29/6	4 L
Galium boreale	--	--	23/6	9 L	20/6	1 L
Rosa sp. (prairie rose)	--	--	25/6	6 L	--	--
Bromus inermis	20/6	1 E	22/6	2 E	2/7	4 L
Gaillardia aristata	--	--	23/6	1 E	--	--
Spiraea alba	--	--	30/6	1 E	--	--
Campanula petiolata	--	--	4/7	9 L	--	--
Lactuca pulchella	--	--	10/7	1 L	10/7	3 E
Chamaenerion spicatum	--	--	6/7	1 E	4/7	5 E
Chrysopsis hirsutissima	--	--	8/7	7 L	--	--
Symphoricarpos occidentalis	21/6	4 E	3/7	1 E	5/7	1 L
Psoralidium argophyllum	--	--	9/7	2 E	--	--
Phleum pratense	--	--	--	--	5/7	2 E
Agastache anethiodora	--	--	--	--	10/7	1 E
Cirsium sp. (bull thistle)	--	--	22/7	7 L	--	--
Solidago canadensis	17/7	?	--	--	20/7	2 L
Grindelia perennis	--	--	26/7	2 L	--	--
Oligoneuron canescens	--	--	28/7	2 L	--	--
Aster laevis	--	--	28/7	2 E	--	--
Wheat - sown	11/5	13 L	12/5	15 L	1/5	1 L
emerged	--	--	23/5	11 L	11/5	1 L
headed	29/6	1 E	12/7	11 L	28/6	3 E
ripe	7/8	2 E	22/8	17 L	29/8	14 L

I. DISEASES OF CEREAL CROPS

WHEAT

BLACK MOULD (Cladosporium herbarum and Alternaria tenuis). The anding crop of spring wheat was affected in many fields in s. Alta. in September; ads, culms, and leaves were darkened (M. N. Grant). Fields similarly affected re observed in Sask., but it was attributed primarily to adverse weather nditions (q. v.) during the growth of the crop and later (H. W. M.). Adverse ather after the crop was ripe caused much weathering and mouldiness in both anding and swathed grain in Man. A large proportion of the kernels of wheat, ts, and barley were found to be darkened upon threshing. In wheat, discoloration s confined mostly to the brush as a result of accumulated spores and mycelium Alternaria and Cladosporium. In oats and barley the discoloration was more ffused over the whole seed. Grain containing such discoloured kernels was scribed as "mildewed" by the grain inspectors and degraded. The loss to the rmers is expected to be heavy (J. E. Machacek).

ERGOT (Claviceps purpurea) infection was 26-tr. 1-sl. 2-mod. / 496 fields spring wheat examined in Alta. (T. R. D., M. N. G.). Ergot was reported to have fected 10% of the heads in a field at Rhein, Sask. About Unity, farmers reported vere and general ergot and claim its absence before the advent of 2,4-D. Tr. -sl. fections were recorded from Laird and Dalmeny. The relatively high percentage ergot in wheat, especially in the park belt, is an interesting problem. It was uch more severe in the University plots than usual (T. C. Vanterpool). Infection s 2% in Redman and R. L. 2573 and traces in Regent, R. L. 2607 and 2622 . Payette); and 10% in Red Bobs in the smut trials at Ste. Anne de la Pocatiere, ue. (R. O. Lachance).

ANTHRACNOSE (Colletotrichum graminicola). A trace was found on natcher at Russell, Man.; a sl. discoloration of the glumes was caused by rows of uiting acervuli (W. A. F. Hagborg).

POWDERY MILDEW (Erysiphe graminis). Infection was: 11-tr. 2-sl. 2-mod. / 6 fields of spring wheat and 4-tr. /38 fields of winter wheat in Alta. (T. R. D., . N. G.); mod. on the winter wheats Cornell 595, Rideau, and Dawson's Golden naff and on several spring wheats in the plots at Ottawa, Ont. (R. V. Clark). See so under Rust Nurseries.

HEAD BLIGHT (Fusarium spp. and Helminthosporium sativum). Infection as moderate in the samples examined. The organisms isolated from each variety nd place were: Ont. - St. Catharines, Lee, F. culmorum and Redman, F. poae and . equiseti. N. S. - Pictou, Little Club, F. avenaceum, Marquis, F. avenaceum, . sativum; Redman, F. avenaceum, F. Poae, H. sativum; Thatcher, H. sativum; appan, Marquis and Mindum, F. avenaceum. H. sativum, and Thatcher, H. sativum L. Gordon). Sl. infection at Edmonton (A. W. Henry).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). fection was 231-tr. 115-sl. 12-mod. 6-sev. /501 fields of spring wheat and 11-tr. 2-sl. 1-mod. 1-sev. /38 of winter wheat examined in Alta. (T. R. D., M. N. G.).

Common root rot was as prevalent in Sask. as in 1949 and was more severe than in 1950. The mean disease rating for 186 fields in 1951 was 13.66. The standard deviation, 8.56, was much greater than usual, indicating widely varying degrees of infection from place to place. The coefficients of variability were particularly high for crop districts 1, 5, 8, and 9, which are in the park belt or black soil zones. The disease ratings for crop districts 1 to 9 were 13.9, 15.9, 16.9, 18.8, 11.0, 13.6, 14.3, 10.5, and 9.9. First estimates of yield for the respective districts were 20, 17, 15, 15, 24, 22, 22, 26, and 22 bu. per acre. The usual strong negative correlation between disease rating and yield, which was -0.901 in 1951, is evident from the data (B. J. Sallans). A trace was present in several varieties in the plots at Ottawa, Ont. (R. V. Clark).

R. D. Tinline (Can. Jour. Bot. 29:467-478. 1951) reports the development of Cochliobolus sativus (Ito & Kurib.) Drechsler ex Dastur in appropriately paired cultures of Helminthosporium sativum. Monoconidial isolates are hermaphroditic and self-sterile and fall into two groups that are intrasterile and interfertile. Pairing of isolates from Sask. to N.S. in Canada and from Wisconsin with test strains proved the two groups to be widely distributed. As only single monoconidial isolates were tested from each place, it is not known whether the two groups occur in the same plant or field or the isolates regularly tend to belong to one or other group (see W. L. Gordon under Fusarium Dry Rot of Potato) (I. L. C.).

TAKE-ALL (Ophiobolus graminis). Infection was 29-tr. 15 sl. 6-mod. 3-sev./499 fields of spring wheat examined (T. R. D., M. N. G.). Take-all, which was found in 34% of the fields examined, was more prevalent than usual, infections being tr-sev. The pathogen also fruited more freely than usual (A. W. Henry). Infection was 3-tr. 1-sl. 1-mod. 1-sev./34 fields of winter wheat examined in southern Alta.; the sev. infection was found at Del Bonita on 16 Aug. (P. M. Halisky). Infection was 6-tr./186 fields in Sask. on the regular survey (H. W. M.). Additional records in the field or from specimens showed tr.-sl. infection. Specimens from Mildred were from a third consecutive crop of wheat after breakin (T. C. V.). Affected fields were mostly in w. central, but some in s.w. Sask. (I. L

J. A. von Arx and Dorthea L. Olivier (Trans. Brit. Myc. Soc. 35:29-33. 1952) report that the take-all pathogen is not a true Ophiobolus, but belongs in the Diaporthaceae-Gnomoniaceae, of which Linospora is a well-known genus, whereas Ophiobolus belongs in the Pseudosphaeriales. They therefore have erected the gen Gaeumannomyces and propose the new binomial G. graminis (Sacc.) v. Arx & Olivi (I. L. C.).

BASAL GLUME ROT (Pseudomonas atrofaciens). Tr. infection in single fields at Beaty (n. e.), and Rama (e. central), Sask. (H. W. M.). Infection tr. at Portage la Prairie, and sev. at Pulp River, the latter being the severest infection ever observed in Man. In this field every kernel was infected in some heads. The pathogen was also isolated from lemmas and empty glumes (W. A. F. Hagborg).

STRIPE RUST (Puccinia glumarum). Sl. infection in one field in s. Alta. (M.N. Grant).

STEM RUST (Puccinia graminis) was not found until late in the season in Alta. e first infection was found on 7 Sept. on Jones' Fife at Cardston. Infection was r. 1-sl./34 fields of winter wheat and 18-tr. 8-sl. 5-mod. 3-sev./511 fields of ring wheat examined. At Barons, in s. Alta., infection was tr. on Red Bobs on Sept. and mod. on Lehmi at Brooks. A mod.-sev. infection developed on winter eat and several susceptible varieties of spring wheat in the Univ. plots at monton and tr.-sl. infection in a few fields of Red Bobs, 15 mi. e. of the city. sewhere east to the Sask. boundary and south to Drumheller only a tr.-sl. ection was present in a few fields of Red Bobs. One of Canus and another of Red bs near Drumheller were moderately infected. Thatcher, the common variety the area, was free from infection (G. B. Sanford, M. N. Grant).

Stem rust infection was 21-tr. 21-sl./186 fields in Sask. Almost all the lds were in s. central and s. e. areas and a few in e. central Sask. Both durum d common wheats including Thatcher were affected (H. W. M.).

Stem rust infection was very light throughout Que. (R. O. Lachance). Only aces of stem rust were found on a survey from Salmonhurst to Fredericton, N. B. L. Howatt). For general review of stem rust, see under Rust Nurseries.

LEAF RUST (Puccinia triticina) infection was 5-tr. 5-sl. 2-mod./34 fields winter wheat in s. Alta. Rust was also sev. at Creston, B. C., on 27 July I. N. Grant). Infection was 98-tr. 88-sl. 76-mod. 47-sev./509 fields of spring heat in Alta. (T. R. D., M. N. G.). Traces were present by mid-August in s. Alta., creasing to mod. infection by September (M. N. Grant). In central Alta. infection as sev. in quite a few fields (A. W. Henry). Infection was 22-tr. 43-sl. 29-mod. -sev./186 fields in Sask. Leaf rust was widespread and probably caused some ss in yield (H. W. M.).

Infection was sl. on winter wheat and mod.-sev. on spring wheat in the plots Ottawa, Ont. (R. V. Clark). Leaf rust was tr.-sev. depending on the variety in e plots at Ste. Anne de la Pocatiere, Que. (A. Payette). See also under Rust urseries.

SPECKLED LEAF BLOTCH (Septoria avenae var. triticea). Infection was 5-tr. 134-sl. 49-mod. 14-sev./505 fields in Alta. (T. R. D., M. N. G.). This fection is noticeably heavier than last year (L. L. C.). On winter wheat, infection . ?tritici) was 5-tr. 3-sl./38 fields (M. N. G., T. R. D.). Infection was 11-tr. -sl. 14-mod. 11-sev./186 fields in Sask., it was widespread over e. Sask., the estern boundary being through Prince Albert, Davidson, Kennedy and Alameda. od.-sev. infections centred about Whitewood, Yorkton, Canora, Wadena, Vonda, ar City and Smeaton (B. J. Sallans). Sl. infections were found at Portage la rairie, Lena, Pine River and Dauphin, Man. (G. J. Green).

GLUME BLOTCH (Septoria nodorum). A tr. was found in a field at Rimby, lta., in winter wheat. Infection was 112-tr. 27-sl. 17-mod. 3-sev./370 fields of pring wheat in central and n. Alta. The disease was much more prevalent than ual in 1951 (T. R. D.). Tr.-sev. infection was present from Dundurn to Unity and orth to Mildred and Snowden (H. W. M.). A sl. infection was noted at Kenville, Man.; e pathogen was isolated from discoloured heads (W. A. F. Hagborg, G. J. Green). ee also under Rust Nurseries.

BUNT (Tilletia caries and T. foetida). The data here presented (Table 1) were obtained from the records of the Board of Grain Commissioners. The percentage of cars graded smutty during the first quarter of the present crop year is unusually low, and the figure for the previous crop year is lower than was to be expected from the data for the first quarter, reported last year.

Table 1. Wheat Bunt in Western Canada

Class of Wheat	Aug. 1, 1950 to July 31, 1951			Aug. 1, to Oct. 31, 1951		
	Cars Inspected	Cars Graded Smutty	Percentage Graded Smutty	Cars Inspected	Cars Graded Smutty	Percentag Graded Smutty
Hard Red Spring	172,161	277	0.16	62,029	55	0.09
Amber Durum	9,418	16	0.17	2,146	4	0.19
White Spring	299	0	0.00	31	0	0.00
Alberta Red Winter	710	34	4.79	237	7	2.95
Garnet	1,794	0	0.00	308	0	0.00
Mixed Wheat	563	2	0.36	174	0	0.00
All Classes	184,945	329	0.18	64,925	66	0.10

F. J. Greaney, in Seedtime & Harvest No. 270, 28 Feb. 1952, points out the need for more seed treatment. Out of 11,993 wheat samples of the 1950 crop tested by the Line Elevators Farm Service, 46% were found to be contaminated with bunt spores, of which 1% contained bunt balls. The corresponding figures for oats were: carrying smut spores 73.5%, with smut "balls" 6%; barley: with spore 89.2%, with smut "balls" 24.2%. There has been some improvement in the percentage of samples free from smut since 1946 (see P.D.S. 27: 6), but the figure for the three crops are still very high. The high percentage of barley samples carrying undispersed masses of spores points to the need of most careful cleaning and treating of barley seed if a crop free from smut is to be harvested (I.L.C.).

Bunt infection was 2-tr. 9-sl. 1-mod. 2-sev./34 fields, or 41% of those examined, in s. Alta. In spring wheat, 4 carried 1-5% and one 10% out of the 126 fields examined (M.N. Grant). Infection was tr.-4% in the 15 affected out of 187 fields examined in Sask. (H.W.M.). No bunt was found in the 75 fields examined in Man. during the 1951 cereal smut survey (W.J. Cherewick, W. Popp). A trace of bunt (T. caries) was found in a field at Luceville, Rimouski Co., Que. (R.O. Lachance).

LOOSE SMUT (Ustilago tritici). Infection was 5-tr. 3-sl./496 fields of spring wheat examined in Alta. (T.R.D., M.N.G.). As usual, loose smut was rarely seen in wheat (4 out of 187 fields) in Sask. and usually only a trace was present (H.W.M.). In 75 fields surveyed in Man. infection was 0-3%, av. 0.13% (W.J. Cherewick, W. Popp). A trace was recorded in a few varieties of winter wheat in the variety plots at Ottawa, Ont. (R.V. Clark) and 12% infection in Huron at Ste. Helene, Kamouraska Co., Que. (R. O. Lachance).

BACTERIAL BLACK CHAFF (Xanthomonas translucens). Infection was -tr. 1-sl./126 fields of spring wheat examined in s. Alta. (M. N. Grant). The sease was common in fields of Thatcher and Saunders in central Alta. (A. W. Henry). ng water-soaked streaks were observed on the leaves in a field at Dodsland, Sask. . C. Vanterpool).

GLUME BLOTCH (non-parasitic). Injury was 4-tr. 3-sl./126 fields of ring wheat in s. Alta. (M. N. Grant).

HEAT INJURY. The outstanding crop trouble in 1951 was the poor filling wheat heads. The disorder was general and extended from Man. across Sask. Alta., causing widespread damage. In some areas, whole fields were more or ss affected; in other districts, the injured plants occurred in irregularly-shaped tches in the field. Yields of affected fields were sharply reduced, in one field, here careful measurements were made, the yield in the affected areas was but one lf that of the normal crop.

The trouble was caused by a complex of factors, the chief of which was the eather. Subnormal temperatures and evaporation rates and above-normal rainfall June and July favoured a lush growth of the crop. However, a hot spell with long riods of sunshine 22-28 July caught the succulent growth at a critical stage in its velopment. The individual plants lost water rapidly and they suffered a set-back retardation of growth. The injury was first noticed as a premature ripening of e plants, but the young developing ovaries had been damaged so that the heads were t filling properly. However other factors were operating. Firstly, in many of e affected fields, the injured plants were suffering more severely from root rot an the plants that had escaped. Secondly, in many fields, glume blotch and eckled leaf blotch (q. v.) were also active. Thirdly, in some fields, where cessive amounts of 2,4-D had been sprayed on the plants, the injury had been eatly intensified. Root rot may well have been present before the dry spell, the 4-D injury was already present, and blotch infections appeared soon after. Of e supplementary causes, root rot was the principal one. Areas with thin surface il or with subsoil of poor structure were badly affected. In some localities, late-wn wheat was less affected than early-sown, probably because the former had t reached the critical stage of development before the dry spell.

After the injured plants began to show up, the weather continued moist and ol. In consequence the heads, leaves, and stems of plants already ripe or dead came covered with black mould.

Glume blotch caused much of the blotching and black streaks on the glumes. he disease was commoner and extended further south in Sask. this season than sual. Some growers confused the purple pigmentation of the culms, most pronounced Saunders wheat, with this trouble. Heavy application of 2,4-D increased the rple coloration (T. C. Vanterpool, P. M. Simmonds).

Samples of wheat heads, in which kernel development had been arrested rematurely and which were later invaded or overgrown by weakly parasitic fungi, iefly Alternaria tenuis, were received from Carman, Belleview, Russell,

Crandall and Oak River, Man. Where whole plants were submitted, rust and root rot did not appear to have been sufficiently severe to account for the damage. Examination of weather records for Cypress River, Brandon and Russell, located in the above area revealed that the daily maximum temperatures were almost continuously 90°F. or higher 23 July-1 Aug., reaching 103°F. at Brandon on 28 Jul The mean precipitation 1 April-1 Aug. was 4.62 in., only 45% of the normal value. Drought and heat may well be the primary cause of the trouble (W. A. F. Hagborg).

OATS

ANTHRACNOSE (Colletotrichum graminicola) was fairly common on oats in central Alta. in 1951 (A. W. Henry).

POWDERY MILDEW (Erysiphe graminis). See under Rust Nurseries.

HEAD BLIGHT (Fusarium spp.). Beaver oats from Nappan, N.S., were severely infected; isolations yielded F. avenaceum, F. culmorum, and F. equiseti (W. L. Gordon).

COMMON ROOT ROT (Fusarium spp.). Infection was 15-tr. 2-sl./292 fiel examined in Alta. (T. R. D., M. N. G.). Seedling blight was observed at Quill Lake, the soil being highly alkaline (T. C. Vanterpool.).

ROOT NECROSIS (Gloeosporium bolleyi Sprague, Phytopath. 38:135. 1948). The pathogen was isolated from specimens of several varieties in the plots at Ottaw and its identity checked by Sprague. In his book, "Diseases of Cereals and Grasses in North America", pp. 289-292, he reports the fungus on 120 cereals and grasses over a wide area in the United States and, in Canada, on wheat in Man. "It is most prevalent on roots of grasses and cereals growing in crowded conditions in poor soi especially sandy soils deficient in nitrogen" (R. V. Clark).

LEAF BLOTCH (Helminthosporium avenae). Infection was seldom more tha a trace in the plots at Ste. Anne de la Pocatiere, Que. (A. Payette). In the Que. Seed Board Plots at 13 places, the average infection was 4-tr. 7-tr. 7-tr. plus, 1- and 1-sl. plus; Erban seemed the most susceptible of the 16 varieties in the test (D. Leblond).

HALO BLIGHT (Pseudomanas coronafaciens). Infection was 154-tr. 61-sl. 14-mod. 1-sev./292 fields examined in Alta. (T. R. D.). Tr.-sl. infections were found at Brandon, Marquette, Poplar Point, and Rosenfeld, Man. The organism was isolated from the Marquette collection and its pathogenicity tested (W. A. F. Hagborg, A. M. Brown). Infection was a tr. in a field in Prince Co., P. E. I. (R. R. Hurst).

CROWN RUST (Puccinia coronata). A sl. infection was found in only a sing field at Wadena, e. central Sask. (H. W. M.). Crown rust was virtually absent alon the Lower St. Lawrence, the Gaspé and Lake St. John district, Que., although up to 75% was observed in a few varieties under test at Ste. Anne de la Pocatiere (R. O. Lachance). Infection was rarely more than a trace in the Q. S. B. plots (D. L

arly-sown oats escaped infection, but some late sowings were heavily rusted in B. (J. L. Howatt). Tr. infection recorded in one field in Kings Co., P. E. I. . E. Campbell). See also Rust Nurseries.

STEM RUST (Puccinia graminis). A very light infection was observed in fields in s. e. Sask. (H. W. Mead). Stem rust infection was very light, if present, e. Que. (R. O. Lachance), but it was mod. heavy on some varieties at Lennoxville). Leblond). At Nictaux, N. S., infection was very light in 2 fields of Ajax, but v. in one of an unknown variety (J. F. Hockey). See also Rust Nurseries.

LEAF SPOT (Selenophoma donacis (Pass.) Sprague & Johnson var. stomaticola aeuml.) Sprague & Johnson, Mycologia 37:639. 1945). A single panicle of Avena tua collected at Harptree, Sask., by B. Boivin shows linear discolorations, which ere quite heavy on the panicle branches and here and there on the glumes. xamination revealed a Selenophoma which agreed closely with the above species. ee R. Sprague, Diseases of Cereals and Grasses, New York 1950, pp. 201-211). should be noted the author of the trinomial is Bäumler (I. L. Conners).

SPECKLED LEAF BLOTCH (Septoria avenae). Infection was 52-tr. 24-sl. -mod. 2-sev./292 fields in Alta. (T. R. D., M. N. G.). Infection was mod. on everal varieties at Kapuskasing and in the plots at Ottawa, Ont. The disease was evere about Kemptville, lesions on the culms apparently causing much of the crop lodge (R. V. Clark). In the Q. S. B. plots infection was sl.-mod., it was the most revalent disease on oats in Que. (D. Leblond). See also Rust Nurseries.

SMUTS (Loose Smut, Ustilago avenae, and Covered Smut, U. kolleri). fection was 19-tr. 18-sl. 8-mod. 3-sev./292 fields examined in Alta. (T. R. D., . N. G.). In a limited survey, covered smut was present in 13 out of 29 fields xamined in Sask.; infection was 0-25%, av. 2% (H. W. M.). In Man., 105 fields oats were examined in the main grain-growing districts west of the Red River, fection of oat smuts was 0-6%, av. 1.0% (W. J. Cherewick, W. Popp). The oat muts were common throughout e. Que., but infection was not as severe as usual . O. Lachance).

Infections ranging up to 5% were noted in Victoria, York, Sunbury, Kings, lbert and Westmorland Counties, N. B. Only traces were seen in Carleton Co., here a seed cleaning and treating plant is located (J. L. Howatt). Loose smut as recorded as sl. in a field in Kings Co., N. S. (R. G. Ross) and tr. in 11 fields xamined across P. E. I. (R. R. Hurst).

BLAST (non-parasitic) was 137-tr. 113-sl. 22-mod. 4-sev./292 fields xamined in Alta. (T. R. D., M. N. G.); 1-tr. 4-sl. 1-mod./28 fields in Sask. Blast as scarcer in 1951 than in other years (H. W. M.). Blast was a trace to sl. plus the Q. S. B. plots (D. Leblond).

CHLOROTIC BANDING. Oat seedlings collected about 31 May at Mont aurier, Que., showed on examination a single white lesion in the centre of the rimary leaf (D. Leblond, I. L. Conners).

GREY SPECK (manganese deficiency). What appeared to be grey speck was observed in specimens received from Edmonton and the Peace River district, Alta. (A. W. Henry). Grey speck was severe in one large field at Spalding, Sask., near to one that was affected in 1949 and 1950 (T. C. Vanterpool). The disorder was seve in single fields at Portage la Prairie and Elm Creek, Man., with considerable loss in yield as a result. It should be noted no survey was made for the disorder in 1951 (W. A. F. Hagborg). Grey speck(?) was general in a single field at Cullodin, P. E. I. (R. R. Hurst).

PHOSPHORUS DEFICIENCY (?). Plants were found stunted and purple in a field near Watson, Sask.; soil was probably alkaline (T. C. Vanterpool).

BARLEY

ERGOT (Claviceps purpurea). Infection was 20-tr. 6-sl./289 fields examin in Alta. (T. R. D., M. N. G.). Out of 85 fields examined in central Alta., infection was tr.-10%. Reports from Camrose and Calgary indicated that infection was severe in those districts and resulted in considerable loss (A. W. Henry). Infected heads found in 3 fields in Sask. Although not common in farmers' fields, it is pres in most experimental plots (H. W. M.).

POWDERY MILDEW (Erysiphe graminis). A trace was found in one field in Alta. (T. R. D.). See also Rust Nurseries.

STRIPE (Helminthosporium gramineum). Infection was 3-tr. 5-sl. 1-mod./ 228 fields examined in Alta. (T. R. D.). Stripe was rare in central Alta., but 5% of the plants were affected in one field (A. W. Henry).

SPOT BLOTCH (Helminthosporium sativum). Infection was 12-tr. 6-sl./61 fields examined in s. Alta. and 2-tr. 3-sl. 1-mod./228 fields in central and n. Alta (T. R. D., M. N. G.). Infection was relatively light in a few fields (4/42 examined) in Man., where the disease was of little importance in 1951 (G. J. Green). A trace infection of spot blotch and root rot was observed in a field of Montcalm examined at Kapuskasing, Ont. The spots varied widely in size on the individual plants. In the variety plots at Ottawa infection was tr.-mod., symptoms varying widely (R. V. Clark). Infection varied from tr. to 35% in the plots at Ste. Anne de la Pocatiere, Que. (A. Payette). A sample of Hannchen sent 14 Sept. from Nappan, N. S., was found with very heavy infection on the nodes (R. V. Clark).

COMMON ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was 88 tr. 46-sl. 6-mod. 2-sev./289 fields examined in Alta. (T. R. D., M. N. G.). A field at Stoney Plain was mod. infected by this disease and take-all, which apparently caused the grain to be shrivelled (A. W. Henry). Infection was 9-sl. 14-mod. 4-sev./27 fields examined in Sask. (H. W. M.).

NET BLOTCH (Helminthosporium teres). Infection was 69-tr. 52-sl. 23-mod. 20-sev./289 fields examined in Alta. (T. R. D., M. N. G.). Less common

ın scald (q. v.) infection was tr. -mod. in central Alta. (A. W. Henry). Infection s 4-sl. 2-mod./27 fields examined in Sask.; the disease was very common on all rieties at the Scott Exp. Sta. (H. W. M.). Recorded in 25 out of 42 fields examined, was the commonest disease of barley in Man. in 1951; widespread and destroying to 75% of the leaf area (G. J. Green).

TAKE-ALL (Ophiobolus graminis) caused sl. plus damage west of Paynton, sk. (T. C. Vanterpool).

STRIPE RUST (Puccinia glumarum). A tr. infection was found in 2 fields ar Falher, Alta. (T. R. D.).

STEM RUST (Puccinia graminis). Infection was 1-tr./61 fields in s. Alta. d sl.-mod. in 2 fields at Creston, B. C. (10 Aug.) (M. N. Grant). A sl. infection s observed in a few fields and Hordeum jubatum was sev. infected at several ints in central Alta. (A. W. Henry). Infection was 4-tr. 2-sl. 1-sev./27 fields amined, the infected fields being in e. central and s. e. Sask. (H. W. M.). A tr. rust was recorded on a single variety at Ste. Anne de la Pocatiere, Que. (A. yette). See also Rust Nurseries.

LEAF RUST (Puccinia hordei). Infection was a tr. in one field and mod. another, both in s. e. Sask. (H. W. M.). See also Rust Nurseries.

SCALD (Rhynchosporium secalis) was very common in Alta. in 1951; infection as 73-tr. 72-sl. 38-mod. 19-sev./289 fields examined. In most fields all plants ere affected (T. R. D., M. N. G.). Similar observations were made in central ta. (A. W. Henry). Infection was 3-mod./42 fields in Man. at Kenville, Santa ara, and Roblin (G. J. Green). A sl. infection was found on Montcalm at Kapuskasing, t. (R. V. Clark).

SPECKLED LEAF BLOTCH (Septoria passerinii). Infection was 31-tr. 31-sl. -mod. 11-sev./228 fields examined in central and n. Alta. (T. R. D.) and 17-tr. sl. 2-mod. 4-sev./42 fields in Man. (G. J. Green).

COVERED SMUT (Ustilago hordei) infection was 18-tr. 32-sl. 5-mod. 7-sev./ 9 fields examined in Alta. (T. R. D., M. N. G.) and tr.-sl. in 26/85 fields in ntral Alta. (A. W. Henry). In 14 out of 28 fields examined in Sask. infection eraged 1.5%, the heaviest 15% (H. W. M.). Specimens affected by both loose and vered smut were received from Carrot River (T. C. Vanterpool). In the 1951 real smut survey in Man., the percentage of smut in barley was 0.0-30.5%, with e average for the 135 fields examined of 0.7% covered, 1.5% false loose (U. nigra) d 2.2% loose smut, or an average for all smuts of 4.4%. Limited observations is year only confirmed previous observations on the great importance of proper plication of a disinfectant for the best control of smut. Fungicides that give mplete control when properly applied fail to do so with less careful application . J. Cherewick, W. Popp).

LOOSE SMUT (Ustilago nuda) infection was 39-tr. 33-sl. 10-mod. 15-sev./ 289 fields examined in Alta. (T. R. D. - M. N. G.). A tr. -mod. infection was observ in 30/85 fields in central Alta. A sl. infection of false loose smut (U. nigra) was also observed (A. W. Henry). Loose smut, including false loose smut, affected 15/28 fields examined in Sask.; 2 fields showed 15% of the heads smutted (H. W. M. Traces occurred in the 21 fields examined across P. E. I. (R. R. Hurst).

L. E. Tyner (Sci. Agr. 31:187-192. 1951) reports good control of loose smu by soaking the seed for 6 hours in water and then in a 0.2% solution of Spergon-SF for 40 hours at room temperature (72-75° F.). Trials in 1951 have suggested that a somewhat longer soak is necessary to eliminate the last traces of smut (10 hours in water, 48 hours in Spergon are necessary for some varieties). Germination is reduced, but no more so than in the hot water treatment (I. L. C.).

BACTERIAL BLIGHT (Xanthomonas translucens). Only a sl. infection was observed in one field in s. Alta. (M. N. Grant) and a few trace infections in central Alta. (A. W. Henry).

FALSE STRIPE (virus). H. H. McKinney (U. S. D. A. Pl. Dis. Reporter 35(1 48. 1951) reported that false stripe of barley was caused by a seed-borne virus that could be transmitted mechanically. The manual transmission of the virus was readily confirmed by using false stripe material collected in field plots of barley in July. The disease was tranferred to seedlings of wheat, barley and rye, but not to oats. It was later transferred readily from wheat to barley. It has been carried through several transfers on barley. On these seedlings the symptoms are mostly a whitening or yellowing in linear streaks or in a mosaic pattern, followed by a yell or brown necrosis When the collapse of the leaf is rapid the green colour may be retained as it dries.

The disease appears to be identical with that described by I. L. Conners (cf. Canada Dept. Agr. Bull. 71, n. s.:13. 1926), who found it affecting barley in th plots at Brandon in 1924, infection being 3.5% in Bark's Excelsior and 15% in O. A. 21. The disease was already known to the late Prof. W. P. Fraser. Specimens of Conners' collection do not appear to have been preserved, but there is one collecte at Winnipeg 28 June 1925 (Bisby 2023) and also one on O. A. C. 21, at Indian Head, Sask., July 1926, leg. P. M. Simmonds, det. I. L. Conners (DAOM 164). °False stripe has been reported in small amounts in 16 of the 27 intervening years (cf. P. D. S. Reports) and also in B. C., Alta., Ont., and P. E. I.

In addition to its role in causing false stripe of barley this virus may be the cause of certain symptoms in wheat such as black chaff. In a greenhouse experime dark discolorations appeared on the internodes and leaf sheaths following the inoculation of headed wheat plants, not yet in flower, with the juice of barley seedlings affected by false stripe. A chlorotic mosaic appeared on the leaf sheaths with both chlorosis and necrosis of the leaf blades, resulting in the early death of the latter. Small necrotic areas in the glumes may provide infection courts for Alternaria tenuis (W. A. Hagborg).

HEAD BLIGHT (undetermined). Infection was 17-tr. 3-sl./228 fields amined in Alta. Tr. sev. infections were observed in 35/85 fields in c. Alta. W. Henry).

MANGANESE DEFICIENCY. Barley was found at Spalding, Sask., in a ld which had severe grey speck on oats in 1949 and 1950. The barley was stunted l the leaf tips were yellowed, but no grey speck symptoms similar to those found oats were present. The stunted, yellowed plants showed no more root-rot injury n the taller, normal-appearing plants (T. C. Vanterpool).

NITROGEN DEFICIENCY. Low fertility with resultant low yield, was dent in a field at Surrey, P. E. I. "Juno spots", dark green patches of vigorously owing plants where the ground had been fertilized by droppings, were noticeable. R. Hurst).

RYE

ERGOT (Claviceps purpurea). Infection was mod. in a field of fall rye at and Forks, B. C., with up to 8 sclerotia in a single head (G. E. Woolliams). fection was 8-tr. 4-sl. 3-mod./31 fields examined in Alta. (T. R. D.), but it was nerally less than might be expected in a wet season (A. W. Henry). A tr. was esent in winter rye at Kentville, N. S.; Agropyron repens growing along the edge the field was heavily infected (D. Creelman). A specimen brought in from a field Queens Co., P. E. I., showed tr. infection (R. R. Hurst).

POWDERY MILDEW (Erysiphe graminis). Infection was a tr. on Storm in e Univ. plots, Vancouver, B. C. (H. N. W. Toms), in one field at Bezanson, Alta. R. D.).

ROOT ROT (Helminthosporium sativum and Fusarium spp.). Infection was tr. 5-sl. 3-mod. 3-sev. in the 31 fields examined in Alta. (T. R. D.), and 1-sl. mod. 2-sev./4 fields in Sask. (H. W. M.).

TAKE-ALL (Ophiobolus graminis). Tr. infection in one field in Alta. (T. R. D.).

STEM RUST (Puccinia graminis). A sl. infection was observed in a field ar Drumheller, Alta. (T. R. D.).

The source of the annual stem rust infection in Western Canada is generally tributed to wind-borne spores from areas farther south rather than to locally erwintered urediniospores. It is, therefore, of some interest that a clear-cut se of overwintering of urediniospores was observed at Winnipeg on couch grass, gropyron repens, in May 1951. On 1 May germination of overwintered urediniospores as 2-20%, depending on the location of the uredinia on the culms, and on 15 May it as tr.-17%. In greenhouse tests, the spores infected rye heavily, but not wheat oats; thus the overwintered rust was rye stem rust of which couch grass is known be a host.

On 22 May, 2 large stem rust pustules were found on the new growth of cou grass beneath stems bearing urediniospores of the previous year. Owing to the location of the pustules, coupled with the fact that they occurred a month prior to t usual appearance of stem rust derived from wind-borne spores, it seems certain that they arose from infections caused by overwintered urediniospores.

This observation of the overwintering of rye stem rust does not permit the inference that wheat stem rust likewise overwinters on its grass host. Only about 1% of the urediniospores on wild barley, Hordeum jubatum, a grass commonly infected with wheat stem rust, were germinable on 1 May and no viable spores wer found in subsequent collections. The possibility exists, however, that this rust ma also overwinter occasionally (T. Johnson).

A sev. infection of stem rust was found on Agropyron repens at Portage la Prairie on 9 Aug. No stem rust was present on adjacent Avena fatua or barley. The occurrence of a very heavy infection, partly as telia, on the couch grass suggested infection from overwintering (W. A. F. Hagborg).

LEAF RUST (Puccinia secalina). About half the plants showed light infectio on Storm in the Univ. plots, Vancouver, B. C. (H. N. W. Toms). Infection was 2-tr 9 fields of rye examined in s. Alta.; first observed near Medicine Hat on 17 Aug. (P. M. Halisky). See also under Rust Nurseries.

SPECKLED LEAF SPOT (Septoria secalis). Infection was 12-tr. 4-sl. 1-m 31 fields examined in Alta. (T. R. D.).

STEM SMUT (Urocystis occulta) was observed in 2 fields, infection being 2% at Lethbridge and 5% at Cardston (P. M. Halisky).

RUST NURSERIES IN CANADA IN 1951

T. Johnson, B. Peturson, A. M. Brown and G. J. Green

This report (November 1951) presents the results of the examination of varieties of wheat, oats, barley and rye, grown in 34 localities in Canada, for the presence of rusts and certain other fungous diseases. (Detailed observations on disease incidence were presented in seven tables but only the general summary giv in the eighth table is here reproduced in Table 2).

Twelve varieties of wheat, six of oats, five of barley and one of rye were grown in the nurseries. The varieties were: wheat - McMurachy, Lee, Carleton, Little Club, Marquis, Mindum, Thatcher, Yaroslav Emmer, Norka, Redman, Exchange and Frontana; oats - Bond, Trispernia, Ajax, Vanguard, Garry and Clint barley - U. M. 43-1020, Peatland, Vantage, H. 106 (Wisconsin) and Montcalm; and rye - Prolific.

ple 2. The incidence of certain pathogenic fungi on wheat, oats, barley and rye grown at 34 localities in Canada in 1951.

Locality	Wheat					Oats				Barley					Rye		
	P. gr. tritici	P. triticina	Erysiphe graminis	Septoria nodorum	Septoria tritici	P. gr. avenae	P. coronata avenae	Erysiphe graminis	Septoria avenae	P. graminis	P. hordei	Erysiphe graminis	Septoria passerinii	Rhynch. secalis	P. graminis secalis	P. secalina	Erysiphe graminis
anichton, B. C.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
assiz, B. C.	0	2	0	0	0	0	0	0	1	0	2	0	0	0	0	3	0
eston, B. C.	2	4	0	0	0	2	0	0	0	2	0	2	0	0	1	0	0
averlodge, Alta.	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
monton, Alta.	2	4	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0
combe, Alta.	3	4	0	0	4	0	0	0	0	1	-	0	4	0	2	-	0
thbridge, Alta.	1	4	3	0	4	0	0	0	0	1	0	1	3	0	1	1	0
ott, Sask.	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
elfort, Sask.	0	3	0	0	0	0	0	0	0	0	0	0	2	3	0	1	0
dian Head, Sask.	2	3	0	0	0	2	0	0	0	2	0	0	0	0	2	2	0
uphin, Man.	2	4	-	-	-	2	0	-	-	2	0	-	-	-	1	3	-
andon, Man.	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0
orden, Man.	1	2	0	0	0	1	0	0	0	1	0	0	1	0	1	-	0
nnipeg, Man.	2	3	0	0	0	2	1	0	0	1	1	0	1	0	2	2	0
. William, Ont.	0	4	0	1	0	2	0	0	4	1	1	0	1	0	1	3	0
puskasing, Ont.	0	4	0	0	0	0	1	0	3	0	0	0	3	0	0	2	0
ndemoya, Ont.	1	4	2	3	0	1	2	0	3	0	4	1	0	0	2	4	0
elph, Ont.	0	4	1	4	0	2	2	0	0	1	4	3	0	0	3	4	0
Catharines, Ont.	0	4	4	0	0	0	0	0	0	0	0	3	0	0	0	2	0
pleton, Ont.	1	4	2	2	0	4	2	1	-	2	1	2	0	0	1	3	0
tawa, Ont.	3	4	3	-	0	3	3	0	3	2	2	4	0	0	2	3	0
rrickville, Ont.	0	3	1	-	0	2	2	0	0	1	0	0	0	0	2	2	0
mptville, Ont.	0	4	3	-	0	2	4	0	4	2	2	4	-	0	2	3	0
lliamstown, Ont.	0	4	1	-	-	0	1	0	-	0	0	0	-	-	0	2	0
acdonald Coll. Que.	0	3	1	0	0	0	0	0	2	0	0	4	-	0	0	2	0
Assomption, Que.	1	-	0	-	-	2	2	0	-	1	-	4	1	-	2	-	0
nnoxville, Que.	0	4	0	0	0	2	1	0	4	2	2	1	0	0	2	3	0
rmandin, Que.	2	4	0	0	0	0	0	0	4	0	0	0	2	0	0	2	0
e Anne de la pocatiere, Que.	0	4	0	0	0	2	2	0	2	1	2	0	0	0	1	3	0
redericton, N. B.	0	4	0	4	0	0	0	0	2	3	0	0	0	0	4	-	0
ntville, N. S.	0	4	3	0	0	4	2	0	3	2	3	0	0	0	3	-	0
ppan, N. S.	0	3	0	3	0	0	0	0	3	0	0	0	0	0	0	2	0
ctou, N. S.	0	2	0	1	0	2	4	0	0	0	0	0	0	0	1	2	0
arlettetown, P. E. I.	0	3	0	0	0	2	1	-	2	0	-	-	0	0	0	2	-

ote: 1 = trace; 2 = light; 3 = moderate; 4 = heavy

The Cereal Rusts

Because of severe winter weather in the rust-overwintering areas of the southern United States, rusts did not overwinter abundantly. Subsequent northward spread of cereal rusts was so delayed by early summer drought in the Dakotas, Minnesota, and southern Man. that stem rust (Puccinia graminis) on wheat, barley and oats did not become apparent in Man. until late in July. Leaf rust of wheat (P. triticina) appeared in Man. early in July, but its spread was so retarded by dry weather that a only light infection had occurred at the time of harvest in the southern parts of the province. In northwestern areas (Dauphin to Swan River) and in adjacent eastern Sask. infection by leaf rust was eventually heavy but occurred too late to cause much damage.

Race 15B of wheat stem rust (P. graminis var. tritici) survived the winter in the southern United States and later increased to such an extent that it made up most of the stem rust on wheat in Man. and eastern Sask. Most of the wheat in southern Man. escaped infection through early ripening, but further north and west there was considerable stem rust infection on Redman, Thatcher and other wheats. The heaviest concentration of infection occurred in the area from Dauphin west to Kamsack and Yorkton and south to Melville where the stand of wheat was very heavy and late. Infections were of a susceptible type and varied in amount from trace to about 15 per cent. Nowhere was infection heavy enough to cause appreciable damage. Escape from damage was, however, not due to any resistance of the wheats concerned but merely because the rust arrived too late in the season to cause any really heavy infection. Stem rust extended westwards, in diminished amounts, through northern Saskatchewan into Alberta where infection, though light, was more than usually prevalent. Though race 15B occurred to some extent in Alberta most of the infection there was caused by race 56, the common race of former years.

Coarse grains were little affected by rust this year in the Prairie Provinces. A scattering of stem rust on barley was caused partly by wheat stem rust and partly by rye stem rust (P. graminis var. secalis). Oats were rusted only lightly by stem rust and very lightly by crown rust. Race 8 was the most common stem-rust race on oats but race 7, widespread for the first time last year, was also fairly common.

Judged by the amount of wheat stem rust in the eastern nurseries, that rust was of little importance in Eastern Canada this year -- stem rust was found on wheat in only 5 out of 20 nurseries east of Man. Rye stem rust was more common; it occurred in 13 of the 20 nurseries. Stem rust, which occurred on barley in 11 of the 20 eastern nurseries was, in most cases, rye stem rust. A moderately heavy infection of barley by rye stem rust occurred at Fredericton, N. B., where a still heavier infection by this rust had occurred in 1949. In that year the presumably stem-rust resistant barleys Vantage and H. 106 carried 60% and 40% infection respectively. In 1951 the infection was lighter - Vantage 5% and H. 106 20% while Peatland and U. M. 43-1020 each showed 10% infection and the susceptible Montcalm 30%. Rye stem rust was also responsible for a moderate infection of barley at Kentville, N. S.

Leaf rust of wheat was heavy on susceptible wheats in most of the eastern rseries. The varieties Lee, Exchange, and Frontana everywhere maintained the h resistance they have shown in former years, as did also the variety Yaroslav mer. Carleton carried 30-40% rust in several eastern nurseries and at hbridge, Alta., but the reaction was of a resistant type. The reaction of Redman ied greatly in eastern nurseries -- from high resistance in some nurseries to l susceptibility in others.

Oat stem rust (P. graminis var. avenae) was light or absent in nurseries Western Canada, but a rather heavy infection developed in several of the eastern rseries. The variety Garry was resistant everywhere, but Clinton showed light st infection in several eastern nurseries, chiefly owing to the presence of race 7.

Crown rust (P. coronata var. avenae) was not found in any nursery west of nnipeg and appreciable infection was limited to the five eastern nurseries at elph, Kemptville, and Ottawa, Ont., Ste Anne de la Pocatiere, Que., and Pictou, S. Except at Pictou, there appeared to be relatively less infection by race 45 d similar races (virulent to Bond and Clinton) than last year.

Leaf rust of barley (P. hordei) was very scarce in Western Canada. Heavy fection by this rust was limited to the eastern nurseries at Guelph and Mindemoya, t. and Kentville, N.S.

Leaf rust of rye (P. secalina) was widely distributed, being recorded in 24 the 29 nurseries examined for its presence.

Other Diseases

Mildew (Erysiphe graminis) was found on wheat in the nurseries west of the eat Lakes only at Lethbridge, Alta., but it occurred in nine nurseries in Ont., d Que. and in one (Kentville, N.S.) in the Maritimes. On barley it was found at eston, B.C., Lethbridge, Alta., and in nine nurseries in Ont. and Que. On oats occurred only, in trace quantity, at Appleton, Ont.

Rather heavy glume blotch (Septoria nodorum) occurred at Guelph and ndemoya, Ont., Fredericton, N.B., and Nappan, N.S., and lighter attacks were ted at Fort William and Appleton, Ont., and Pictou, N.S. Speckled leaf blotch of eat (S. tritici) was confined to the two Alberta nurseries at Lethbridge and combe, where heavy infection developed. Speckled leaf blotch of oats (S. avenae), ich is annually present in Eastern Canada, was more than usually prevalent in 51. Its presence was recorded in 13 of the 20 eastern nurseries. In nine of these rseries infection was considered to be moderate or severe. A moderate infection scald (Rhynchosporium secalis) developed in four western nurseries, Beaverlodge d Edmonton, Alta., and Scott and Melfort in Sask.

PHYSIOLOGIC RACES OF CEREAL RUSTS IN CANADA IN 1951

T. Johnson, B. Peturson, A. M. Brown and G. J. Green

This report (January 1952) presents the results of the survey for the distribution, in Canada, of the physiologic races of several cereal rusts. Race identification was carried out for wheat stem rust (Puccinia graminis var. tritici), leaf rust of wheat (P. triticina), oat stem rust (P. graminis var. avenae), oat crown rust (P. coronata var. avenae), and leaf rust of barley (P. hordei). Collecti of stem rust from barley Hordeum jubatum and Agropyron spp. were analysed for the presence of wheat stem rust and rye stem rust (P. graminis var. secalis), but no attempt was made to determine the physiologic races of the latter rust. The original report contained tables showing the distribution of the physiologic races of the respective rusts by provinces, but these are here omitted. Cereal rust development in Canada has already been discussed in the report of the Rust Nurseri (q. v.).

Puccinia graminis var. tritici

The 178 isolates of wheat stem rust from wheat, barley and wild barley were identified as the following races (the number of isolates of each race in brackets): 1 (2); 2 (2), 11 (1); 15B (85); 16 (1); 17 (5); 38 (5), 48 (3); 49 (1); 56 (71); 69 (1); C. 51-2 (1). As only 11 of the isolates came from east of Manitoba, this year's ste rust survey is largely confined to Western Canada.

Race 15B appears to have been the predominant race in the Prairie Province in 1951, followed closely by race 56. It is probable, however, that the prevalence of race 15B is considerably exaggerated by the fact that many collectors who sent in rust specimens for identification collected these from wheat varieties that had prove resistant to stem rust in former years. Rust collected from such varieties was almost exclusively race 15B. There is, nevertheless, little doubt that this race wa the predominant one in western Man. and eastern Sask. In other areas it was less prevalent than race 56, the most common race for many years. There appears to be a close relationship between the major concentration of race 15B and that of the wheat varieties Thatcher, Regent and Redman. In Alberta, where a number of othe wheats are grown race 56 was much more common.

Some comment is called for in connection with race distribution in southern Alta. and the Creston area of southeastern B. C. In this region certain races occur (races 1, 2, 11, 16 and 48 and an apparently new race designated as C. 51-2) that were not found in other parts of the Prairie Provinces. The occurrence of races 2 and 48 on both sides of the Rocky Mountains suggests that spore dispersal may take place across the mountains in southernmost Alberta or in the adjacent United States The fact that six races were identified from the 13 isolates from the neighborhood o Creston, B. C. suggests a considerable variety in the physiologic-race population of that locality. It may also be remarked that the two isolates of race 2 though identifi as that race, bear a rather close resemblance to race 59B, which was found in the Creston area in 1950. The race designated as C. 51-2 gave rise to the following infection types on the differential hosts:-

C. Ma. Rel. Ko. Arn. Mnd. Spm. Kub. Ac. Enk. Ver. Kpl. Lee

4 2- 3= 3 0; 0; 1 3 1 0; 1 1-

All collections of stem rust from barley and wild barley, Hordeum jubatum, re analysed for the presence of wheat stem rust and rye stem rust. In 60 lections from barley (18 from Eastern Canada and 42 from Western Canada), isolates of rye stem rust and 29 of wheat stem rust were obtained. In the 18 lections from Eastern Canada, only rye stem rust could be found. In the 42 lections from Western Canada, wheat stem rust and rye stem rust were present about equal proportions - 29 isolates of each being obtained. It is worth noting t 14 collections made on the stem-rust resistant varieties Peatland, Vantage, 106, Moore, and U. M. 43-1020 produced only rye stem rust.

Twenty-two collections of stem rust on wild barley were made in the airie Provinces. From these were obtained 13 isolates of wheat stem rust and of rye stem rust.

Despite the frequent occurrence of rye stem rust on barley varieties nerally regarded as stem-rust resistant, the cultures of rye stem rust thus far idied do not appear to be highly virulent to these varieties in the seedling stage. of the 59 isolates from barley and wild barley, as well as several from rye and ropyron and Elymus species, were inoculated to seedling leaves of the wheat-stem-st susceptible variety Montcalm and the resistant variety Vantage. Montcalm oved, in general, to be moderately susceptible while Vantage showed rather high sistance to all cultures as did also the varieties Peatland, Chevron, Feebar and ndred in tests with a number of cultures. In view of the apparent field susceptibility some of these varieties to rye stem rust it appears that the reliability of seedling action as a criterion of the resistance of barley varieties to this rust needs further udy.

ccinia triticina

All rust collections were originally inoculated to the susceptible wheat Little ub and a "screening set" composed of the varieties Exchange, Lee, Gabo, and ontana. From the infections on Little Club two single-pustule isolates were tablished for each collection. In cases where large rust pustules were produced any of the screening varieties cultures were established to determine the race or ces responsible for them.

As in the two preceding reports the races are designated according to the nified Numeration" of the key agreed on, in 1948, by American and Canadian vestigators of this rust. The old racenumbers corresponding with the new ones e also given.

Races bearing the suffix "a", as 1a, 15a, are virulent on seedlings of Hope d most Hope and H44 derivatives.

The 372 isolates studied were identified as follows (number of isolates in brackets): UN 1 = races 1 (35), 1a (24); UN 2 = races 15 (5), 15a (82); UN 3 = race 58 (69); UN 5 = race 5 (82); UN 6 = race 126 (47); UN 9 = race 9 (3); UN 10 = races 11 (18), 38 (2); UN 11 = race 93 (3), UN 14 = race 128 (2), and UN 17 = race C-2 (2). Race C-2 originally described by Brown and Johnson (Can. Jour. Res. C, 27:191-2 1949) produces the following infection types on the standard differential hosts:

Mal.	Car.	Brev.	Web.	Lor.	Med.	Huss.	Dem.
0	2	2	3	3	3	1	3

The distribution of leaf rust races is not greatly different from that of the two preceding years. UN 2 (race 15), UN 5 (race 5) and UN 6 (race 126) were the predominant races in the Prairie Provinces except for southern Alta. where UN 1 (race 1) and UN 10 (race 11) were collected more commonly than any other races. The two last-mentioned races were also the predominant ones in southeastern B. C. (the Creston area).

UN 3 (race 58) accounted for more than 60 per cent of isolates from collect made in Eastern Canada where it has been the prevailing race for a number of yea

Biotypes virulent towards Hope, H-44 and their derivatives were very much more common in Man., Sask., and northern Alta., than the less virulent races.

Puccinia graminis var. avenae

The following ten races were identified in a study of 102 isolates of oat sten rust (number of isolates of each race in brackets): 2 (10); 3 (1); 4 (1); 5 (2); 6 (2); 7 (9); 8 (37); 10 (27); 11 (12); and 13 (1).

One feature of this year's survey is the sharp decline in the prevalence of the races in race-group 1-2-5 which declined from 38.1% in 1950 to 11.8% in 1951 This decline appears to be highly significant as these races constituted 31.6% of oa stem rust isolates in 1949, 54.6% in 1948, and 50.5% in 1947. A simultaneous ris has taken place in the prevalence of the races of race-group 8-10-11 which rose from 44.1% in 1950 to 74.6% in 1951. Previous figures for this race group were 62.0% in 1949, 43.4% in 1948, and 49.5% in 1947.

Race 7, which became widespread for the first time in 1950, was found aga this year but only in Man. and Sask. and constituted only 8.2% of all isolates. One culture of the closely related race 3 was isolated from Que.

The occurrence in this year's survey of four isolates of races in race group 4-6-13 suggests the possibility that these races may be gaining wider distribution than heretofore. Races of this group were found in trace quantities every year fro 1925 to 1930 but were collected thereafter only in 1935 and 1937 until 1944; since then they have been found, though rarely, each year except in 1947 and 1948. Wid distribution of these races would be a matter of concern as they are capable of attacking all the varieties of oats now cultivated in North America.

ccinia coronata var. avenae

Thirteen physiologic races were isolated from 126 uredinial collections of own rust obtained from widely separated localities in Eastern Canada and the airie Provinces.

Races 2 and 3 were the most prevalent races in Eastern Canada where they mprised 79.6% of all isolates identified. Both these races were also present in Prairie Provinces. There they comprised 25% of all isolates. Six of the races , 45, 57, 1946-1, 1947-1 and 1948-1) attack Bond and its derivatives. These races were quite prevalent in the Prairie Provinces, comprising 68.7% of the lates in that area. In Eastern Canada they formed only an insignificant part of isolates. Although races 34, 45 and 57 were relatively less prevalent in the airie Provinces in 1951, then in 1950, the difference in relative prevalence of se races in the two years was probably not significant. However, in Eastern nada, these races were significantly less prevalent in relation to other races ntified in 1951 than in 1950. In Eastern Canada, the crown rust inoculum that tiates crown rust infections on oats in the spring may arise either from ciospores from buckthorn bushes in Eastern Canada and adjacent states of the S.A., or from windborne urediniospores from oat fields in the corn belt of the ited States. Therefore, the relative prevalence of the races that occur each year uld be influenced by the relative amounts of inoculum arising from these two rces. Oat varieties susceptible to races 34, 45 and 57 and immune to races 2 d 3 predominate in the U.S. corn belt, while in Eastern Canada much of the oat reage is grown to varieties susceptible to races 2, 3, 34, 45 and 57. Furthermore, as been shown in previous surveys that races 2 and 3 occur much more frequently buckthorns in Eastern Canada than the other races mentioned. It may then be erred that, in 1950, when races 34, 45 and 57 predominated in Eastern Canada, larger part of the inoculum initiating spring infections came from infection ters in the United States where these races predominate. In 1951, on the other nd, it appears that much of the inoculum initiating infections in 1951 came from ckthorn bushes in Eastern Canada.

No races were isolated that can appreciably attack the varieties Trispernia, ctoria, Landhafer or Santa Fe, all of which are currently being used by Canadian nt breeders to confer crown-rust resistance on new hybrid varieties.

ccinia hordei

The dwarf leaf rust of barley, Puccinia hordei was collected in both Eastern d Western Canada in 1951. Most of the collections were made on the varieties ntcalm and Vantage, but none of the collections indicated that this rust occurred more than trace amounts.

A number of isolates were cultured on the standard differential hosts, but y race 4 was identified. The isolates of this race were distributed as follows mber of isolates in brackets): N.S. (2), Que. (4), Ont. (7), Man. (5), and B.C. . No collections were made in N.B., Sask. or Alta.

Race 4 of this rust is known to occur in the Eastern United States, where it has caused considerable reduction in barley yields, especially in 1950. According to Dr. C. W. Roane, Agr. Expt. Station, Blacksburg, Virginia, this rust is capabl of overwintering in that area in the uredinial stage. This condition might, in part, explain the heavy infestation that occurred on barley in Que. and Ont. in 1950, as barley crops in these provinces would undoubtedly be exposed to wind-borne urediniospores, originating on barley crops south of the international border.

II. DISEASES OF FORAGE AND FIBRE CROPS

ALFALFA

BLACK STEM (Ascochyta imperfecta). Sl. infection in the rod rows at nichton, B.C. (W. Jones). Infection was 7 tr. 22 sl. 24-mod. 3-sev./71 fields mined in the Peace River area, Alta. (J.B. Lebeau). The disease was general ughout the irrigated areas of s. Alta. Infection was sl.-sev. in June and July owing a wet, cool spring. Its unusual prevalence caused considerable anxiety lfalfa seed growers in the Brooks district, but no sev. damage was reported. er the weather became warm and dry there was a marked decrease in the infection he second growth (E.J. Hawn). Infection was 8-sl. 15 mod. 19-sev. in the 42 ds examined in Sask. Black stem killed much of the first growth made during and August, giving to many fields a brown cast, which was gradually replaced he green of the second growth. Although conditions looked favourable in early , seed set was poor. For the second year the weather has been cool and moist, ourable for the development of the disease and poor for burning the stubble. In sequence, there has been a build-up of inoculum on fallen leaves and stubble W. Mead).

Black stem was present in all parts of Man., and was particularly noticeable he northern seed-growing area. Infection was mod.-sev. on the leaves and stems. as also present on pedicels and pods, and in one field severe lesioning appeared educe seed set markedly. The severity of the disease was sharply reduced in ds that had been burned in the spring (W.C. McDonald).

WINTER CROWN ROT (low-temperature basidiomycete). Damage was slight he plots at Lethbridge, Alta., and it was suspected to have caused injury to one d observed near Pincher Creek late in the season (M.W. Cormack, E.J. Hawn). Saskatoon and in n. Sask. 14 fields showed scattered light infection, 4 mod. and ev. In the latter fields over 40% of the stand was destroyed, the affected plants ng in irregular patches (H.W. Mead). The pathogen was isolated by M.W. Cormack m diseased material collected from a field near Durban, Man. Typical symptoms he disease were observed in other fields in the area, and its prevalence in Man. l be investigated in the spring of 1952 (W.C. McDonald).

ANTHRACNOSE (Colletotrichum destructivum) caused sl. infections on mm at two places in Kamouraska Co., Que. The casual organism was again lated from girdled stems. Leaves on affected plants were reddish from an umulation of carbohydrates. The pathogenicity of the organism has not been ted (R.O. Lachance).

BACTERIAL WILT (Corynebacterium insidiosum). Diseased plants were eived for examination from Salmon Arm, B.C. (G.E. Woolliams). Examination plants taken from 23 fields in s. Alta. showed the average percentage of infected nts to be 33.7 in stands seeded in 1948, 23.6 in stands sown in 1949, and 4.0 hose seeded in 1950 (E.J. Hawn). Wilt infection was 1-tr. 1-sl. 1-mod./71 ds examined in the Peace River District (J.B. Lebeau).

In one field, 7-8 years old, in the Kenville area, Man., plants were severely affected. In other fields infection was nil-tr. (W. C. McDonald). Several specimens of alfalfa from the Guelph area Ont., were submitted for examination and the pathogen successfully isolated. Infection was mod.-sev. in limited areas in the fields (E. H. Garrard). Bacterial wilt was rather severe in one field at Ste. Anne de la Pocatiere, Que. In Nicolet Co. and elsewhere in Kamouraska Co. only trace were found in an occasional field. As alfalfa is usually grown in mixed stands with grasses for hay, and very frequently under pasture, diagnosis of disease is often very difficult. No wilt was observed in the St. Jean and St. Hyacinthe districts (R. O. Lachance).

ROOT ROT(various organisms) was observed on plants sent from Falkland, B. C., for diagnosis. The District Agriculturalist stated that most of the plants in the field were stunted with islands of normal plants. Moisture supply was considered adequate for normal growth (G. E. Woolliams). Infection was 2-tr. 3-sl./71 fields examined in the Peace River District and 4-tr. 7-sl/12 fields in the Sangudo area, Alta. (J. B. Lebeau). Root rot (Cylindrocarpon ehrenbergi) was found associated with winter crown rot in 2 fields in Sask., damage was tr. (H. W. M.).

A detailed survey of root and crown rotting fungi presently being made in Man. has resulted in the frequent isolation of Rhizoctonia solani, Cylindrocarpon ehrenbergi, Fusarium acuminatum and F. avenaceum (W. C. McDonald).

STEM NEMATODE (Ditylenchus dipsaci) was found in the Lethbridge, Raymond, Glenwood, Turin, and Brooks districts in s. Alta. and the infestation was 5-tr. 5-sl. 1-mod. in the 31 fields examined. There was no evidence of increase in the incidence of the disease in fields or plots where infested plants were found in 1950 (E. J. Hawn). Nematodes were found on the crowns of 2 plants in the Laboratory nursery, Edmonton. The plants are hybrid selections from the Forage Crops Laboratory, Saskatoon, Sask. The nematode, however, has not yet been observed at Saskatoon (G. B. Sanford).

LEAF SPOT (Leptosphaeria pratensis (Stagonospora meliloti). Tr. infection in 2 fields near Falher, Alta. (J. B. Lebeau). Light infection in 4 fields in the White Fox - Hudson's Bay area, Sask. (H. W. M.). Tr. infections in scattered areas of Man. (W. C. McDonald).

DOWNY MILDEW (Peronospora aestivalis). Infection was sl.-mod. in the plots at Lethbridge, Alta. tr.-sl. in fields in the Brooks area in July (E. J. Hawn) and sl. infection in 2 fields in central and n. Alta. (J. B. Lebeau). A single field, heavily infected, was found in the Swan River area, Man. (W. C. McDonald). Downy mildew caused sl. damage to a field of Grimm near Kingston, Ont., and in a field of the C. E. F., Ottawa; affected leaves died and considerable twisting of stems was observed (W. R. Childers, F. S. Nowasad). Infection was severe in single fields at St. Gregoire, Nicolet Co., and St. Pascal, Kamouraska Co., Que. Only a trace was seen at Ste. Anne de la Pocatiere (R. O. Lachance).

YELLOW LEAF BLOTCH (Pseudopeziza jonesii). Infection was: Tr. in the ietal nursery at Lethbridge, Alta. (E. J. Hawn); 3-sl. 4-mod. 3-sev./71 fields mined in the Peace River District (J. B. Lebeau); 8-sl. 2-mod./42 fields in Sask., n mixed with common leaf spot (H. W. M.); and 7-sl. 2-sev./44 fields in Que. O. Lachance).

COMMON LEAF SPOT (Pseudopeziza medicaginis) was general on several ieties at the Exp. Farm, Agassiz and on Rhizoma in the Univ. plots, Vancouver, C. (H. N. W. Toms). Infection was tr. in the varietal nursery at Lethbridge, Alta. J. Hawn) and 18-tr. 27-sl. 12-mod./71 fields examined in the Peace River area B. Lebeau). Infection was estimated as 4-sl. 8-mod. 3-sev./42 fields in Sask.; bliation was light even where infection was heaviest (H. W Mead). The disease eared to be less prevalent than in other years in Man.; no sev. infections were erved (W. C. McDonald). Common leaf spot can be found in almost every stand alfalfa in Que., infection being tr.-mod. Infection is usually severe when the ting of the crop is unduly delayed (R. O. Lachance). A mod. infection was reported a field in Colchester Co., N S., in June and a trace in one in Cape Breton in gust. (C. O. Gourley.). In the first field, M. lupulina was also infected W. Creelman). A trace was found in a field in Queens Co., P. E. I. (R. R. Hurst).

CROWN BUD ROT (Rhizoctonia solani, etc.) apparently caused by izoctonia solani, Fusarium spp., and possibly other fungi, was again prevalent alfalfa stands in s. Alta. Detailed survey data show the average percentage of ected plants to be as follows: 100% in fields sown in 1947 and 1948, 93.6% in nds sown in 1949, and 50.7% in those sown in 1950. There is thus a large itive correlation between age of stand and severity of the disease. First reported 1950 under Crown Rot (P. D. S. 30:29) (E. J. Hawn).

WILT (Sclerotinia trifoliorum). A few plants were found wilting and sclerotia sent in a field at St. Damien, Bellechasse Co., Que (R. O. Lachance).

ROOT GALLS(?virus). Numerous galls were found on roots of alfalfa plants one hybrid line from Saskatoon, planted in the Laboratory nursery at Edmonton, a. Examination failed to reveal any nemotodes present. It is suggested that galls are of virus origin comparable to those on sweet clover described by M. Black (Am. Jour. Bot. 38:256-267. 1951) (G. B. Sanford).

WITCHES' BROOM (Virus). Trace infection observed in 2 fields in the her district, Alta. (J. B. Lebeau).

In 1946 J. D. Menzies (Phytopathology 36 762-774. 1946) reported the success- transmission of witches' broom of alfalfa from plant to plant by a leaf hopper ntified as Platymoideus acutus Say and by grafting to Medicago lupulina and M. pida. In a recent paper, E. C. Klostermeyer and J. D. Menzies (Phytopathology 456-458. 1951) report the successful transmission of the virus to 15 species in Leguminosae, including Melilotus albus, Trifolium pratense, and T. repens hite and Ladino clover). The insect nector is now identified as Scaphytopius oanthanus) dubius (Van Duzec) (I. L. C.). This leafhopper is very close to S. atus (Say), and until recently was considered to be a variety of that species.

It replaces acutus west of the Rocky Mountains from California to B. C. It is found on a large number of host plants. Specimens have been seen from the Soda Creek Quesnel region of B. C. ; they were collected in connection with studies on witches' broom of potato, which occurs in the area. S. dubius and S. acutus are highly variable species and it has been suggested that one or both may consist of several races with different food plants but morphologically indistinguishable. So far, this seems to be only a theory, unsupported by experimental evidence (Bryan P. Beirne

YELLOWS (boron deficiency) was general especially in the n. Okanagan Valley and around Salmon Arm, B. C. (G. E. Woolliams). Yellows was quite comm on light sandy soils in Que. , whereas it was seldom observed on heavy clay or silt Damage was sl. -mod. in 19 out of 44 fields examined; all samples were checked microscopically (R. O. Lachance).

WINTER KILLING. Damage was 4-tr. 18-sl. 13-mod. 3-sev. /71 fields examined in the Peace River District, Alta. , damage was sl. in 3 fields in the Sangudo district (J. B. Lebeau). Winter injury was observed in 6-42 fields examin in Sask. causing sl. damage. Injury was less severe than in previous years, possibly because soil moisture conditions were good in the fall of 1950 (H. W. Mead Winter killing was sl. -sev. in Que. Plants located in low spots in the various fiel were all destroyed, whereas grasses such as timothy overwintered quite well. Heavy rains fell in December and January (R. O. Lachance).

COMMON CLOVER

WINTER CROWN ROT (low-temperature basidiomycete) caused sl. damage in 2 Sask. stands sown in 1949, but some winter injury was also present (H. W. Me

SOOTY BLOTCH (Cymadothea trifolii) was general on alsike clover in field about Kentville, N. S. , causing some yellowing and drying of the leaves; the disease was also recorded on red clover at the station (D. W. Creelman). The fungus was collected on the native species, Trifolium fimbriatum, at Long Beach, B. C. (W. N

POWDERY MILDEW (Erysiphe polygoni) was quite general on Dollard red clover, a recent introduction from Macdonald College at Grand Forks, B. C. Some 35-50% of plants were severely affected, whereas the others were free of infection although intermixed with diseased ones (G. E. Woolliams). Tr. infection on red clover in one field in Queens Co. , P. E. I. (R. R. Hurst).

ANTHRACNOSE (Kabatiella caulivora). Infection was 5-tr. /9 fields examined in the Peace River District, Alta. (J. B. Lebeau). Heavily infected fields showing severe damage were found at Lansdowne, Digby Co. , and at the Kentville Station, N. S. ; infection estimated to be 50-75% (K. A. Harrison, D. W. Creelman).

LEAF SPOT (Pseudopeziza trifolii). Tr. infection was observed in a field at Dawson Creek, B. C. (J. B. Lebeau). A 5% infection was recorded in red clover at Kentville, N. S. (D. W. Creelman).

LEAF SPOT (Stagonospora recedens) caused a tr. infection in a field at her, Alta. (J. B. Lebeau).

RUST (Uromyces fallens). A tr. was recorded in a field in Queens Co., .I. (R. R. Hurst).

MOSAIC (Trifolium virus 1). A tr. to 3% mosaic was found in 6 fields of clover in 4 counties of N. B. (D. J. MacLeod).

YELLOWS (?virus) affected tr. -1% of the red clover plants in 2 fields in k, and one each in Sunbury and Carleton Counties, N. B. (D. J. MacLeod).

WITCHES' BROOM (?virus). A tr. of witches' broom was found in 3 red ver fields in York and Carleton Counties, N. B. (D. J. MacLeod).

FLORAL ABNORMALITY. A striking abnormality in alsike clover, in which inflorescence is proliferated into a mass of minute, pale green or whitish bracts, eceived at Ottawa from time to time for examination. A virus infection is mmonly suspected, but since such plants usually occur singly in the fields this se is doubted. There are 2 specimens from Ont. and 3 from Que. in the nerogamic Herbarium. The earliest is dated 1902 and so was collected long ore the use of DDT and 2,4-D, which might also be suspected except for the sporadic urence of the plants. The most recent specimen to hand was received from near verlodge, Alta. W. E. Sackston has observed a similar condition in an alfalfa nt from a field at Gilbert Plains, Man. Observations on the occurrence, nature, persistence of the condition would be of interest (W. G. Dore). The abnormality observed in Que. in Ladino clover in 1949 (P. D. S. 29:24) and again in 1950 1951. It has also been observed in alsike clover (R. O. Lachance).

WINTER KILLING (low temperature) was severe in a large plot of hybrid s at Melfort, Sask. (H. W. M.).

SWEET CLOVER

BLACK STEM (Ascochyta meliloti) was common in the plots at Saskatoon and lfort, Sask.; it also caused mod. damage in 10 fields in n. e. Sask. out of 15 mined (H. W. M.). The disease was very prevalent on plants of yellow sweet ver both along the roadsides and under cultivation, particularly as the stems tured, in Essex Co., Ont. Some 5-20% of stems were infected (W. G. Benedict).

LEAF SPOT (Cercospora davisii) was found affecting Melilotus albus in lden Twp., Essex Co., Ont., 19 July (W. G. Benedict, D. B. O. Savile).

LEAF SPOT (Leptosphaeria pratensis (Stagonospora meliloti) was common sweet clover throughout s. central and s. w. Ont., in the 30 counties visited G. Benedict).

DOWNY MILDEW (Peronospora meliloti). A light, well scattered infection was observed on sweet clover at Spalding, Sask. The crop on Mn-deficient soil, but the plants showed no symptoms that might be attributed to the deficiency (T. C. Vanterpool).

ROOT ROT (Phytophthora cactorum) caused sl. -mod. damage to growth in a plot in a 4-year rotation of wheat sown down to sweet clover, sweet clover, suga beets, and sugar beets. Although the rotation was laid down in 1929, no damage h been observed previously in the sweet clover (M. W. Cormack, E. J. Hawn). Root rot was found affecting 1% of the plants of yellow sweet clover in a field in Essex Co., Ont. Severe sweet clover failure was not in evidence this year although the fungus, which is thought to be associated with a soft rot of corn roots and sweet clover crowns, was isolated in the spring (W. G. Benedict).

LEAF SPOT (Pseudopeziza medicaginis) affected 6% of leaves in a collecti made at Maidstone, Essex Co., Ont., on white sweet clover (W. G. Benedict).

MOSAIC (virus) was common on sweet clover wherever it was growing in th Okanagan Valley, B. C. (G. E. Woolliams).

VETCH

ANTHRACNOSE (Colletotrichum viciae Dearn. & Overh.). A heavy infecti occurred in a field sown down to hairy vetch in a forage crop experiment at Kentvi N. S. Both the leaves and stems were affected, resulting in yellowing and defoliati of the lower leaves. Stems were brown, shrunken and dried out and thus of very l value as feed, (KP1789) (D. W. Creelman). This pathogen has not been previously reported in Canada (I. L. C.).

BUCKWHEAT

YELLOWS (Callistephus virus 1) affected 2-31% of the plants of tartarian buckwheat in 8 fields examined in central N. B.; a trace was also present on Silver Hull in a field in York Co. (D. J. MacLeod).

CORN

EAR ROTS (Diplodia zeae, Fusarium graminearum and F. moniliforme). Ear rots caused by each of these pathogens occurred in trace amounts on all varieties throughout Ont. in 1951 (W. E. McKeen).

LEAF SPOT (Helminthosporum turcicum) occurred on several commercial hybrids, the centre of infection being in Kent Co., Ont. Infection was severe in some fields and killed all the plants in a few by 1 Sept. This is the first time that the disease has occurred in epidemic proportions in Ont. (W. E. McKeen).

BACTERIAL LEAF SPOT (Pseudomonas syringae). Mod. infections were erved at Fort Garry and Morden, Man. The organism was isolated and proved e pathogenic. The bacterium is apparently Ps. syringae but cultural study was omplete (W. A. F. Hagborg).

RUST (Puccinia sorghi). Infection was mod. throughout Ont. and was not severe as in 1950. For additional observations on the 1950 epidemic see U. S. D. A. Dis. Reporter 35(8):367. 1951 (W. E. McKeen). A mere trace was recorded in eld in Queens Co., P. E. I. (R. R. Hurst).

ROOT ROT (chiefly Pythium arrhenomanes) caused sev. damage in many ds in Ont. in 1951; all varieties were affected (W. E. McKeen).

STALK ROT (complex of organisms) caused mod. damage, affecting all ieties, in Ont. (W. E. McKeen).

A Phialophora species apparently previously unrecognized, was found on corn ts in soil near Chatham, Ridgetown, and Harrow, Ont. Due to its colour and asite-host relations it may have been mistaken previously for Rhizoctonia solani Rhizophagus. It can be isolated only when a piece of apparently healthy corn-root sue with the adhering mycelium is removed from an infected root and placed on r media. After 2-3 months of culture on nutrient and potato dextrose agar it t its ability to sporulate, but this ability was revived when it was cultured on moist n roots. No sexual stage of this organism has been found. The fungus may attack n roots at any time throughout the season and its brown runner-hyphae or macro-hae grow parallel to the roots. The finer infection hyphae or micro-hyphae etrate the outer root tissue and there infection threads are surrounded by "wall ules". This fungus is quite aggressive, but not very pathogenic, and apparently s followed by numerous secondary organisms. The similarity of this organism Ophiobolus graminis is very marked (W. E. McKeen). The fungus is being cribed by R. F. Cain as Phialophora radicicola in Can. Jour. Bot. 30(3). May 2 and an extended account of the disease by W. E. McKeen will appear in a separate er in the same number (I. L. C.).

Other new diseases of corn found by W. E. McKeen at Harrow, Ont., have n described and illustrated by him: "A hitherto unreported corn disease" (U. S. D. A. Dis. Reporter 36(4):143-144. 1952) and "A seed-borne disease of corn" (ibid. 4):144-145. 1952). The first appears to be a genetic weakness; however, the necrotic ions yielded Curvularia inaequalis and Alternaria sp. The second has much the earance of a virus disease (I. L. C.).

SMUT (Ustilago maydis). A tr. infection occurred on all varieties throughout . (W. E. McKeen). A single ear was infected in a planting at Woodville, N. S. G. Ross). Traces were observed in Queens Co., P. E. I. (R. R. Hurst).

FLAX

Prof. T. C. Vanterpool, University of Saskatchewan, has prepared a special dy on "Flax Diseases in Saskatchewan in 1951" which appears below.

Except very occasionally flax diseases were not generally conspicuous this year. The subnormal temperatures from June to the end of the season probab proved unfavourable for their development despite the above-normal rainfall and subnormal evaporation rates. These conditions, however, were responsible for th development of saprophytic black moulds (Alternaria, Cladosporium, Epicoccum) on the standing plants late in the season. Although the weathered grain has, on the average, a germination of 10-15% below that of early harvested grain, it was carrying an unusually low percentage of seed-borne pathogenic fungi. The lowered germination appears to be attributable to the physiological conditions imposed by weathering.

RUST (Melampsora lini). As usual, rust infection varied from none to sev according to the field. Infection on Royal was the heaviest since 1948. Dakota fla on the prairie showed none to trace, but in the eastern park belt, particularly aro Kamsack, several fields with moderate infections were recorded. It appears that the rust strains attacking Dakota are building up in the park belt. At Wadena and Kipling, deep rust lesions on the pedicels appear to have been responsible for noticeable breaking off of bolls. Hail was definitely not responsible. Pycnia and aecia first appeared on volunteer flax at Saskatoon on 31 May.

SEEDLING BLIGHT (Rhizoctonia solani). Two very severe cases of seedli blight was observed east of Sutherland. On one farm the flax stand on summerfall was only 35% of that on adjoining cereal stubble; both pieces of land were sown wit the same lot of seed and at the same time. On another farm the stand on summer-fallow was 60% of that on cereal stubble. (cf. Sackston, P. D. S. 27:30-31). On the first farm, barley had been 'seeded into' the poor summerfallow flax stand. Elsewhere on a limited spring survey this disease was negligible.

ALTERNARIA SEEDLING BLIGHT (Alternaria linicola). The most definite case of seedling damage by A. linicola ever observed was found at Clair on flax sown on new breaking. The seed came from Kipling in the southeast park belt whe A. linicola is known to occur. The characteristic red lesioning of hypocotyls and cotyledons and the slow killing of the seedlings make it readily distinguishable fro seedling blight caused by Rhizoctonia solani. From 17 flax-seed samples selected for their low germination, A. linicola was the parasite that appeared most frequen on plating, but it occurred only slightly more frequently than usual. Polyspora lin Fusarium spp. and Botrytis cinerea were present only in traces.

BROWNING and STEM BREAK (Polyspora lini) was reported from Hershell Stranraer, Kindersley, west, north and east of the Quill Lakes, Sheho, Theodore, and Marshall. Infection on the open prairie was slight and did not affect yield, alt the seed may be carrying the fungus. At Marshall, in the park belt, two fields intended for registration were examined for disease on 22 Aug. One sown with 195 Elite Royal seed carrying over 20% P. lini had developed about 30% typical stem break, and surprisingly few leaf and stem lesions, but showed severe boll lesionin which probably became worse later in the season. The other sown with 1949 Elite Royal lightly contaminated with P. lini showed about 5% stem break, traces of leaf and stem lesions, and moderate boll lesioning. Isolations from infected bolls fro both these fields yielded P. lini. Another field on fallow in the same district sown

Dakota free of P. lini, showed a light infection of the bolls from which P. lini cultured; the source of inoculum in this field is unknown. Also in the park belt, h of Wadena, 5% of stem break was found in one field and 10% in another; both ved slight stem and boll lesioning. These findings add further support to my ention that flax used for seeding should come from the open prairie; seed from park belt should always be examined for seed-borne pathogens before being used seed.

PHOMA FOOT ROT. In experimental plots a 40% reduction in germination ax was produced by strains of Phoma lini when they were used to inoculate the . Stem lesions with good pycnidial development were common on surviving plants. er the same conditions, strains of Phoma exigua caused 75% reduction in germi- on, but no basal stem or other lesioning was detected on the survivors. Victory the most resistant variety and Redwing the least to these Phoma species; of the e varieties, Gossamer was more resistant than Liral Dominion. The moist, cool son was favourable for these tests at Saskatoon.

HEAT CANKER (physiological). None encountered.

2,4-D INJURY. Growth of flax sown on a portion of a wheat-stubble field delayed by spraying with 2,4-D, thus reducing its competitive power against unteer wheat plants, which tillered well. In the unsprayed portion, the wheat nts were mostly one-stemmed. The difference in appearance of the two portions he field was very conspicuous from a distance. Here, we have an anomalous ation in which a 2,4-D application has increased weeds! Spray injury of the stem- ding and distortion type was found at Bruno, Laura, and at two places west of gina.

LIME-INDUCED CHLOROSIS has only been observed before on small areas re the soil was slightly alkaline or high in total salts (cf. P. D. S. 23:23 and 25:31). s year in one field north of the Quill Lakes, about 75% of the plants were pale low to light green with slight stunting; in another field east of the Quill Lakes, ut 30% were affected, but there was no apparent decrease in height. The trouble also observed at Lanigan. When the Quill Lake fields were visited before harvest plants had recovered their colour. The prolonged cool weather in June presumably ayed the availability and absorption of certain nutrient elements.

MISCELLANEOUS. Browning and stem break, and pasmo were again absent he Irrigation Nursery at the University. No pasmo was encountered on the fall vey in e. and s. e. Sask. Late root rot (Fusarium spp. and Rhizoctonia solani) not conspicuous.

W. E. Sackston has also summarized his observations in a special report, ax Diseases in Manitoba in 1951".

Flax acreage in Man. in 1951 was 594,000 acres, almost double the figure 1950. There was a severe drought over much of the flax area during June and y, but the crop was saved by good moisture reserves from 1950 and by unusually

cool weather throughout the dry period. Yields averaged only about 7 1/2 bu. per acre. Rains fell at harvest time and at frequent intervals from harvest time until freeze-up. A period of clear weather permitted harvesting much of the standing flax in southern Manitoba after freeze-up, but part of the crop in the north was covered with snow. The dry weather during the growing season restricted the occurrence of most diseases, but the wet weather at harvest was favourable for the growth of saprophytes with consequent severe discoloration of flax stems, and weathering and discoloration of the seed.

A survey was made from 23 July to 1 Aug. through Man. and e. Sask. as fa north as Yorkton; 91 fields were examined. Most of the fields were in bloom, but some were still in the seedling stage, and the flax was ripening in others. During a limited survey in s.w. and s. Man. 29-30 Aug., 20 fields were examined. Most of the flax examined was ripe or ripening at the time of the late survey, but the bolls were just turning colour in a few fields.

RUST (Melampsora lini) was again the outstanding disease of flax and was much more severe than in 1950. Although weather was not particularly favourable for rust development, inoculum from 1950 was abundant and large areas were sown to the susceptible variety Dakota. Dews were sufficiently frequent even during the drought period to permit spore germination and development of heavy infections. No rust was found in fields of Rocket or Sheyenne. Of the 91 fields examined in Ju 28 were free of rust. Of these fields, 15 were identified as Rocket or Sheyenne, while the others were either unidentified resistant varieties or else escaped infecti Traces of rust were found in 24 fields, 1-5% in 18, 10-25% in 14, 50% in 5, and 7 in 2 fields, the estimates being of the uredinial infections on the leaves. Uredinia were found on stems in a few fields, and the telial infections were about 10% on the stems in four of the most heavily diseased fields. Several of the worst fields were located across the fence or across a road from fields where flax was rusted in 195 One grower reported that rust was relatively light on Dakota sown early in May, whereas it was very heavy in a field sown late in May.

Four of the 20 fields examined at the end of August were free of rust. Thre of these were resistant varieties. Telial infection was a trace on the stems in 1 fi 5-10% in 6, 15-20% in 6, and 25-35% in 3 fields. Stem-rot lesions associated wit rust telia were conspicuous in several fields. Plated tissues yielded mostly Alterr tenuis and Fusarium spp.

PASMO (Septoria linicola). Pasmo was found in only 10 of the 20 fields examined during the late survey. There were traces of the disease in 9 fields, and 5% in 1 field, of the susceptible variety Viking. Very heavy infections were obtain in inoculated plots, however, indicating that the dry, cool weather prevented disea spread rather than development.

BOLL BLIGHT (cause unknown). Traces were seen in three fields in the early survey. Drought apparently caused blighting in these fields. Observations made during the late survey apparently fitted the hypothesis that boll blight is caus by unfavourable weather conditions following conditions that favour formation of flo primordia. There were traces to 10% of boll blight in 8 fields, 15-25% in 9, and

% and 50% in one field each. Rust was responsible for part of the blighting and boll and bud abscission in the 35% field. The 50% field was extremely late. ere was very little boll blighting, and a full complement of seeds per boll, but v bolls per plant, in fields showing evidence of early and protracted drought. e low boll set is in marked contrast to the greater numbers of bolls per plant en moisture conditions are favourable in June and July, and the much higher cidence of boll blight when the favourable weather is followed by a hot, dry period bsequent to flower and boll formation.

MISCELLANEOUS. A trace of Seedling Blight was found in one field, and attered blighted seedlings were found in the experimental plots at Winnipeg. izoctonia solani was isolated from the Winnipeg material. Traces of Wilt were und in three farm fields. Severe wilting occurred in a plot of German flax at the ax Pilot Plant, Portage la Prairie, Man., sown where flax straw had been stacked previous years. Fusarium oxysporum f. lini was isolated from the wilted material, d from a few wilted plants in plots at Winnipeg. Top Discoloration, attributed in 51 to early drought that killed the tissues, and late rains that favoured the growth microorganisms in them afterwards, was seen in 15 of 20 fields in the late survey. ere were tr. -5% of top browning in 3 fields, 25-50% in 10, and 75% in 2 fields. ist and stem rot contributed to the discoloration in one of the two last fields. ere were traces to 5% of Heat Canker in 7 fields examined in July, and about 10% one field reported by a grower in June. Injury caused by 2,4-D was observed in few fields. Terminal growing points were killed and numerous branches formed apical whorls in three fields, and maturity was delayed by 10-14 days. Traces leaf spot was seen in 7 fields, and 5-30% of the leaves were spotted in 5 fields. uch of the leaf spotting may have been caused by drought. Drought was definitely sponsible for the premature ripening and death of plants in large patches on light ils in s.w. Man. Hail Damage, with 25-50% of the bolls broken off or shelled out, as seen in 2 fields.

Other Observations

WILT (Fusarium oxysporum f. lini). A few plants of Stormont Gossamer L 26 ere affected in the plots at Ottawa, Ont. (R. V. Clark). In a survey in Yamachiche ., Que., tr. of plants were wilted in 4 fields, tr. -5% in 2, and 5-10% in 6/12 elds examined. At the Station, Ste. Anne de la Pocatiere, 25% of the plants of Liral ominion were affected in a plot on a low spot (R. O. Lachance).

BROWNING and STEM BREAK (Polyspora lini). A sl. infection was observed a field near Burdett, in s. Alta. (P. M. Halisky); infection was 3-tr./9 fields amined in the Peace River District (T. R. D.)

RUST (Melampora lini). Infection was 2-tr. 1-sl. 1-mod./15 fields surveyed s. Alta. (M. N. Grant) and a trace was seen in one field in the Peace River District . R. D.). Some lines of Stormont Cirrus were sl. affected at Ste. Anne de la ocatiere, Que., while most were rust-free. The same lines were severely rusted Winnipeg and Saskatoon (R. O. Lachance).

MUSTARD

WHITE RUST (Cystopus candidus). Severe infection resulted in pronounced malformation of scattered plants in several fields of cultivated mustard south of Lethbridge, Alta. Infection was also observed on wild mustard in the area (M. W. Cormack). Specimens of yellow cress, Rorippa islandica (Older) Borbás, were collected by J. E. Campbell in Queens Co., P. E. I., 24 July 1951 (I. L. C.).

SAFFLOWER

RUST (Puccinia carthami) was first observed on 27 July in the variety plots at Lethbridge, Alta. Infection was tr.-mod. in both the dry-land and irrigated plo by mid-September. See also Table 3 (F. R. Harper).

Table 3. - Disease Ratings in Safflower Variety Tests, 1951
Dominion Experimental Station, Lethbridge, Alta.

Variety	Av. Rust Infection	Av. Root Rot Damage %
N3	sl.	0
N5	tr.	0
N8	mod.	0
N472	sl.-mod.	0
Indian	mod.	1
N805	mod.	38
N6	tr.-sl.	40
N10	sl.-mod.	83
N852	tr.	98
N9	tr.	100

ROOT ROT (Pythium sp.) caused an estimated damage of 0-100% in the different varieties in the irrigated plots at Lethbridge in spite of the plots being in a new location over 1/2 mile from any land previously sown to safflower. No infection was observed in the same varieties in the dry-land plots. For individual varietal reactions see Table 3 (F. R. Harper, M. W. Cormack).

HEAD ROT (Sclerotinia sclerotiorum) was found affecting the flower heads of safflower in the University plots, Saskatoon, Sask. The infected heads dropped off easily when touched or blown by the wind. In some lines, over half the heads were diseased and no line was immune. Isolations from affected peduncles and receptacles yielded the organism; isolations for 3 partially developed seeds yielded Botrytis cinerea. Both fungi were highly pathogenic to safflower seedlings on agar plates. Isolations of S. sclerotiorum made in 1950 from rape and sweet clover wer also pathogenic (T. C. Vanterpool).

SOYBEAN

Dr. A. A. Hildebrand has submitted a special report, "Diseases of Soybeans outhwestern Ontario in 1951".

During the current year, the disease situation in soybeans in s. w. Ont., was in assessed through surveys not only of commercial plantings but more especially stands being grown for seed, of varietal trial plots scattered through the area, of the experimental plots, including a 'disease garden' at the Harrow laboratory.

STEM and ROOT ROT (Pythium ultimum). In early July a stem and root rot soybeans was found almost simultaneously in Essex and Kent Counties. Affected nts, occurring singly or in small groups are dwarfed and usually wilt; later they ome necrotic, brown and dry out. It was demonstrated experimentally that the ease is favoured by low soil temperature (11-12°C.), although if the organism plentiful in the soil, it is capable of destroying the seed over a relatively wide ge of soil temperature (11-27°C.). The corelation observed between low soil nperature and pathogenicity of the fungus is the probable explanation for mortality he seedlings in the field being confined to the earlier, cooler part of the growing son. Although losses in the field this year due to this new disease were negligible, discovery adds another organism to the growing list of pathogens that must be nbatted for the successful culture of soybeans in Ont.

STEM CANKER (Diaporthe phaseolorum var. batatis) and POD and STEM IGHT (D. phaseolorum var. sojae). From the evidence to date, the most important ease of soybeans in Ont. should be definitely designated Stem Canker rather than d and Stem Blight as formerly. In the last 2 years, isolations from affected plants e yielded in pure culture the perfect stage of fungus readily identifiable as a porthe. Single ascospore isolates of some 20 strains obtained to date, produce, urn, the perfect stage, thus indicating the homothallic nature of the fungus. cnidia have never appeared in any cultures originating from single ascospores. steamed soybean stems, the perithecia are produced in caespitose heads. On the is of its sexual behaviour, morphological characteristics, and pathogenic caplity, this fungus seems to be indistinguishable from the perithecial strain of phaseolorum var. batatis described by A. W. Welch and J. C. Gilman in 1948 ytopath. 38:628-637). If this diagnosis is correct, then D. phaseolorum var. atis is being isolated almost to the exclusion of D. phaseolorum var. sojae.

In only 9 occasions have pycnidial strains been obtained from diseased stems. ree were obtained in 1950 and the other six only recently. Experiments are in gress to determine whether or not these strains are heterothallic and possibly ntical with D. phaseolorum var. sojae (cf. Welch and Gilman, ibid).

Stem canker was found first in 1951 on 27 July. As the season advanced, the ease became epidemic throughout most of the soybean-growing area in s. w. Ont, luding Pelee Island. Since the same thing has happened for the last 3 years, the ease is apparently now thoroughly established. No variety escaped infection, but rked varietal differences in incidence of the disease were noted. In the soybean ease-nursery, the incidence of stem canker on varieties under conditions of

natural infection was as follows: Harman, 3.5%; Harosoy, 4.5%; A.K. Harrow, 5.1%; Adams, 5.2%; Harly, 6.5%; Richland, 7.6%; Earlyana, 9.8%; Lincoln, 9.9 Monroe, 12.7%; Hawkeye, 15.2%; and Blackhawk, 24.3%. Counts made in comme stands and in the varietal test plots revealed that infection levels often differed fro the figures given above, but where comparison could be made the varieties tended to retain their relative positions. Hawkeye and especially Blackhawk, were often more severely infected than indicated above. The apparent high degree of resistance of Harman is in striking contrast to the almost complete susceptibility of Blackhawk. Stands of Harman were examined in which not a single infected plan could be found and in only a single case did infection run as high as 9%. In Blackha on the other hand, heavy infection was the rule and in not a few instances the yield seriously reduced. Hawkeye, from the same cross as Blackhawk (Mukden x Richla was slightly less susceptible than the latter variety. It may be noted that among th first five of the most resistant varieties indicated four, namely, Harman, Harosoy A.K. Harrow, and Harly, are of Canadian origin.

As has been stated in previous reports, it is impossible to assess with accuracy the losses due to this disease. In the aggregate, they must be serious. From mid-July until the end of the growing season, there is a period of approximat two months during which the disease increases in intensity and becomes more wide spread. Not only the yield but also the quality of the seed from affected plants, because of their hastened maturity, is reduced.

BROWN STEM ROT (Cephalosporium gregatum) was first noted in 1951 in the laboratory plots on 17 August on which date it was affecting varieties with maturity dates differing as widely as those of Earlyanna and Lincoln. Later, in September, the disease was found in so many commercial stands that there is little doubt of its widespread occurrence in s.w. Ont. Harman, which shows appreciable resistance to stem canker is, unfortunately, very susceptible to brown stem rot.

VIRUS DISEASES. Three virus diseases encountered more frequently this year than in 1950 were Soybean Mosaic (Soja virus 1), Yellow Mosaic (Phaseolus virus 2), and Bud Blight (virus of tobacco ring-spot group). In previous reports no differentiation was made between soybean mosaic and yellow mosaic but, during the past summer, the two were differentiated on the basis of selective host reactio Of the three viruses diseases, bud blight is the most serious.

BROWN SPOT (Septoria glycines). In most years brown spot, after appear early in the season on the pair of unifoliate or first true leaves, disappears and is not seen again until the next season. This year, on 10 Sept., diseased specimens were sent to the laboratory by a grower from Komoka, Middlesex Co., who stated that the disease was causing considerable loss of plants in localized areas in his field. The disease, which was affecting both leaves and pods, was found to be brow spot. On 21 Sept., leaves on plants in the laboratory plots showed brown spot lesi Whether these late-season findings of brown spot are significant is unknown. The might mark the beginning of a trend similar to that which developed in Illinois a few years ago. According to D.W. Chamberlain (Soybean Digest 8:18. 1948) "Brow Spot, once a minor leaf spot, has become the most damaging of the leaf spots in Illinois".

MISCELLANEOUS. Manganese Deficiency which, during the years 1948, 9, and 1950, was the cause of concern to many growers over widespread areas, s scarcely apparent in 1951. Downy Mildew (Peronospora manshurica) and cterial Blight (Pseudomonas glycinea) were noted in the surveys but were relatively mportant.

Following a series of electrical storms in early July, Lightning Injury, which easily be mistaken for a parasitic disease, was observed in three different ds. Hail Damage caused considerable loss in certain areas. Abrasions, received plants when they were young, later developed excrescences and so weakened stems to result in excessive lodging. Sun Scald (non-parasitic) was present as usual.

Other Observations

BACTERIAL BLIGHT (Pseudomonas glycinea). Mod. infection was observed Black Eye at Brandon, Man. (W. A. F. Hagborg). The disease was found occurring solated patches in soybean fields in the Guelph area, Ont. (E. H. Garrard). A d. infection was recorded in Early Blackeye in the plots at Ottawa (K. M. Graham).

SUDAN GRASS

BACTERIAL LEAF SPOT (Pseudomonas syringae). Sl. infection observed at combe, Alta. (L. E. Tyner).

SUGAR BEET

LEAF SPOT (Cercospora beticola) was more prevalent in s. w. Ont. this ason than for several years (A. A. Hildebrand).

LEAF SPOT (Phoma betae). Sl. leaf infection was found in several fields s. Alta. Usually the pathogen only attacks the roots, but leaf infection may have en favoured by the prevailing wet conditions in 1951 (F. R. Harper).

BLACK ROOT (various fungi) was found in all of the 43 representative fields mpled before thinning in s. Alta. The level of infection this year was much the me as in 1950 (P. D. S. 30:42-43) and the differences between districts were not nificant. Most of the infected plants were eliminated during thinning and no further velopment of root rot was observed during the season. Phoma betae was the edominant isolate as material from 79% of the fields yielded the organism. hanomyces cochlioides occurred more commonly than in previous years, being monstrated in material from 51% of the fields; its greater occurrence was probably ing to the unusually wet season (F. R. Harper, M. W. Cormack).

Black root of sugar beet seedlings was in general sporadic in its occurrence s. w. Ont. However, in districts that had been flooded, following continuous, avy rains, the disease was more prevalent and a large number of growers suffered vere losses. There was a tendency also in these districts for the disease to come chronic and to persist after blocking and thinning had been completed . A. Hildebrand).

BORON DEFICIENCY is attracting more and more attention each year in s.w. Ont. This year the effects of the deficiency were evident over a wider area than usual and were particularly severe along the advancing northern and eastern fringes of the sugar beet area. Boron deficiency may well become more important than black root in the successful growing of the crop (A. A. Hildebrand).

SUNFLOWER

A special report "Sunflower Diseases in Manitoba in 1951" was prepared by Dr. W. E. Sackston.

Sunflowers were sown in 1951 on only about 21,500 acres in Man., largely as a result of relatively low yields and prices in 1950. Drought in June and July, and low temperatures throughout the growing season, made weather conditions agai unfavourable for the crop. In all, 37 fields were examined for disease 14-17 Aug., when the plants were anywhere from early bloom to a week past full bloom and 40 others, 17-20 Sept., when most fields were 7-10 days from maturity; some, 15-20 days from maturity; and a few, prematurely ripe. Dr. E. D. Putt, Cooperative Vegetable Oils, Altona, and Sr. Mario Astorga, Santiago, Chile, assisted in the early survey; and W. A. Russell, Dominion Experimental Station, Morden, and J. A. Fehr, Coop. Vegetable Oils, Altona, assisted in the late survey.

RUST (Puccinia helianthi). Rust infections were heavier, and damage more severe, in 1951 than in the 3 previous years. Weather conditions were not particul favourable for rust development, but inoculum from 1950 was abundant, and dews were adequate, even during the drought period, for spore germination and infection In fields seeded early, rust damage was in some cases aggravated by drought injur Some of the late-sown fields, which were sufficiently immature to benefit materiall from the August and September rains, appeared to escape the heaviest rust infections and injury.

The inbred female parent S37-388 of the hybrid variety Advance again prove extremely susceptible to rust; the hybrid, although heavily rusted or even killed by rust in some fields, was in no case as severely infected as the inbred plants which occurred in every hybrid field. Sunrise, the male parent of Advance, rusted less heavily than the hybrid. Only one field of Mennonite was examined; it appeared to b comparable to Sunrise. The heaviest rust infections observed were all in the main sunflower area. Even in the main area, however, some fields were seen with light to moderate infections.

The importance of volunteer sunflowers in fields and along roadsides in initiating severe outbreaks of rust was noted again in 1951. On 14 June, A. M. Brown found open aecia on many volunteer sunflowers along the edges of Highway 1 the main road through the centre of the sunflower area, and in adjacent fields. He stated, "There is no doubt that aeciospore inoculum in this area is a potential threat, and if favourable weather conditions for rust development prevail, a sunflow rust epidemic can be expected". On 12 July he found uredinia on many leaves of every plant examined in a field near Rosenfeld where no rust was present 14 June.

unteer sunflowers along the roadside and in a nearby stubble field had open aecia the leaves.

Only one field examined in the early survey was free of rust. It was in the lying area. There were traces of rust in 9 fields, all outlying; 5-15% on the er leaves, traces on the upper leaves, in 7 fields (Advance in the main area, -388 in outlying areas); 25% on the lower leaves, 2% on the upper, in 1 field; 50% rust on the lower leaves, tr.-10% on the upper, in 12 fields; 60% or more the lower leaves, 20-50% on the upper, in 2 fields; lower leaves killed by rust, % or more on upper leaves, in 5 fields.

In the late survey, only traces of rust were present in 3 fields all in outlying as. There was 15% rust on the lower leaves, tr. on the upper, in 3 (outlying), -30% on lower leaves, 10-15% on upper, in 8 (Advance in the main area, S37-388 outlying areas); 40-65% on lower leaves, 20-50% on upper, in 12 (S37-388 in lying areas, Advance and Sunrise in central area); lower leaves killed by rust, -60% on upper, in 6 (S37-388 in outlying areas, Advance in central area); plants led by rust, in 8 fields. Three fields of Advance were among those killed by rust; rossing blocks (with the S37-388 killed), in outlying areas, with volunteer plants adjacent fields as the source of inoculum; 2 fields of S37-388 foundation stock, h yields sharply reduced; and 1 field of S37-388 foundation, in which no seed uld be harvested.

WILT (Sclerotinia sclerotiorum) was found in 28 of 37 fields examined in the rly survey. There were traces in 23 fields, 1-2% in 3, 35%, and 50% in 1 field ch. Infection apparently started at or near the ground line in most cases. Only o plants were found with a Sclerotinia infection originating in the midstem portion. the field with 35% wilt, sunflowers followed several crops of field peas. In the ld with 50% wilt, sunflowers followed six successive grain crops.

Wilt was found in 20 of 40 fields examined in the late survey. There were ces of wilt in 18 fields, 1% in 1 field, and 50% in 1 field, a crossing block, in ich 35% wilt was found in the early survey. The grower observed that Sunrise emed to show wilt infection earlier in the season than S37-388, and the percentage Sunrise affected in September seemed somewhat higher.

HEAD and NECK ROT (Sclerotinia sclerotiorum and Botrytis cinerea). aces of head and neck rot were found in 22 fields in the late survey. In 15 fields, ly Sclerotinia sclerotiorum was found associated with the rot. In 4 of these fields, Sclerotinia wilt was found, and in only 1 field was there more than a trace of wilt. 4 fields some of the head and neck rot was caused by Sclerotinia, while others the rotted heads were covered with the sporulating Botrytis. In 3 fields all the ad rot was apparently caused by Botrytis. Bacterial rot of the necks and heads s seen in 1 field of Sunrise foundation, in which a jelly-like rot, possibly bacterial, the stems was present. The relative abundance of head and neck rot in 1951 may attributable at least in part to the low temperatures and frequent rains during gust and September. Such weather conditions may have been favourable for the oduction of ascospores of Sclerotinia, as well as for sporulation and infection

by Botrytis. The rare occurrence of Sclerotinia infections anywhere except on the basal portions of sunflower plants in most years indicates that wilt is usually initiated by soil-borne inoculum. The occasional occurrence of Sclerotinia rot of sunflower heads in Man. has been attributed to chance transfer of sclerotia, possibly by birds. Most of the wilt infections in 1951 apparently occurred fairly early in the growing season while the weather was still dry, and therefore presum were initiated by soil inoculum, as usually postulated. Although no apothecia of Sclerotinia were found, ascospore infection of the heads in 1951 seems fairly probable, as sclerotial infection seems to be an inadequate explanation of the numerous infections observed.

DOWNY MILDEW (Plasmopara halstedii) was found in one crossing block in the early survey. There were traces of mildew on the Sunrise plants, but approxi mately 1% of the S37-388 plants were diseased. The amount of mildew in this crossing block had not increased noticeably by the time of the late survey. Traces of downy mildew were found in two other fields in the late survey. Affected plants were stunted by early systemic infection. No localized infections on leaves of adul plants were found. Downy mildew was also quite conspicuous in the plots of Cooperative Vegetable Oils, Altona, and some was seen in plots at Morden.

STALK ROT (cause unknown). Stalk rot and premature dying and drying of stems was found in 17 of 40 fields in the late survey. Most of the fields free of the disorder were in outlying areas, in none of the clean fields was rust very heavy. Traces of stalk rot were found in 6 fields; in 2 of these, in addition to the prematu browning of stems, and fungal discoloration of the pith, there was a blackening of stems, petioles, and peduncles, occasionally involving the heads as well. The blackened tissues, particularly the peduncles, shrivelled and dried out. A jelly-li black rot of the pith was present in all the blackened plants. Bacteria predominate in isolates from the rotted tissues. One per cent of the plants in a field of Sunrise foundation was affected by the black jelly rot. Numerous plants in plots at Altona were also diseased. Sunrise apparently is more subject to this disease than is S37 388. The more common premature browning and dying of stalks was associated wi severe rust injury in 10 fields. In several of the fields, the external browning was apparently caused by rust infection and drought, as the pith was still fairly sound a clean in many of the plants, and borer infestation was moderate. In other fields, borer tunnels were numerous in the stems, and the pith was discolored or destroy by fungi. Five to 10% of the stalks were broken over in two fields of Advance kille by rust, and 25% of the plants were broken over in a field of S37-388 foundation destroyed by rust.

MISCELLANEOUS. Powdery Mildew (Erysiphe cichoracearum) was found on a few leaves in two fields in the late survey. Necrotic Leaf Spots were seen in 6 fields in the early survey, and in 4 fields in the late survey. Some of the early spotting may have been caused by soil drifting or other mechanical injury. Considerable necrosis was observed around rust pustules. No Septoria Leaf Spot was found. Leaf Mottle (cause unknown) was found on a few plants in 5 fields, and on about 2% of the plants in 1 field, in the early survey. The field with 2% had about

% of the plants destroyed by Sclerotinia wilt. In the late survey, leaf mottle may e been present in 1 field of Mennonite sunflowers, seeded in check row hills. e plant per hill was dead in about 50% of the hills, and 2 or 3 plants were dead in eral hills. The stems and roots of the dead plants appeared sound. Mottling was ected on a few leaves. Slight 2,4-D Damage was seen in several fields. Fasciation unrise plants was conspicuous in 1 crossing block. The upper stems were divided 2 to 5 or 6 branches, formed at very sharp angles to the perpendicular. Head op (cause unknown) was identified with the assistance of Senor Astorga, who has n up to 10% in commercial fields in Chile. Affected plants cannot be distinguished m normal in any way until the head drops off at flowering time. Abscission takes ce at about two inches below the head. The break is clean and even, looking as ugh the head had been removed with a knife. Often a short piece of epidermal sue is torn from the remaining stem as the head drops, or, rarely, the head may nain attached to the stem by such a strip of epidermis. Several cases of head op were seen in plots at Altona, in 8 farm fields, and in plots at Winnipeg.

Other Observations

DOWNY MILDEW (Plasmopara helianthi) affected 20% of the plants and WILT lerotinia sclerotiorum) was a trace in a planting of Mammoth at Ste. Anne de la catiere, Que. (R. O. Lachance).

CULTIVATED and OTHER GRASSES

EGILOPS SQUARROSA

Leaf Rust (Puccinia triticina). Infection was mod. in test plots at Lethbridge, a. (P. M. Halisky) and severe on this species in Rust Laboratory plots, Winnipeg, n. (A. M. Brown).

GROPYRON - Wheat Grass

Stem Rust (Puccinia graminis) See under Rye: Stem Rust.

Snow Mould (Sclerotinia sp. indet.) Extensive damage was reported by G. Savage in the grass plots at the Station, Prince George, B. C. The disease s estimated to have destroyed 10-100% of the plants in strains of Agropyron, Bromus, ymus, Festuca, Phleum, Poa, and other grasses. Similar damage was also ported on winter wheat in the area. Numerous sclerotia were produced in the lms of the dead grasses and the damage was first ascribed to a Typhula. All mples, however, have yielded a low temperature Sclerotinia, which is being udied (M. W. Cormack).

GROSTIS

Rust (Puccinia rubigo-vera). A 20% infection was found on A. tenuis growing ong a roadside at Centerville, N. S. (KP1687) (D. W. Creelman).

Bunt (Tilletia pallida G. W. Fischer, Mycologia 30:393. 1938). Bunt balls replaced about 5-7% of the seed in a sample of velvet bent grass, A. canina, from East Baltic, P. E. I. As the seed was supposed to have been cleaned the infection in the field was probably higher (W. G. Sallans). T. pallida was known previously on A. canina in N. J., Ohio, and R. I. and on seaside bent, A. palustris, in Oregon. The pale colour of the spores in mass, smaller size of the spores and the deep irregular reticulations readily separate it from T. decipiens, which occurs on brow top, A. tenuis in N. S., on St. Pierre and in Europe., but not apparently in the United States (I. L. Conners).

BROMUS

Leaf Spot (Selenophoma bromigena). Plots of B. inermis at the station, Lethbridge, Alta., showed a sl. infection (E. J. Hawn).

DACTYLIS GLOMERATA - Orchard Grass

Crown Rot (Fusarium culmorum) caused the death of 5-10% of the plants in rod rows at the Station, Saanichton, B. C. The fungus sporulated freely on the necrotic leaves, and its identity was verified by W. L. Gordon. The roots were apparently not affected (W. Jones).

Purple Leaf Spot (Mastigosporium rubricosum) was common at the Station, Saanichton, B. C.; the fungus was in abundant fruit 5 April (W. Jones).

Brown Stripe (Scolecotrichum graminis) was heavy at Kentville, N. S. 4 Oct (D. W. Creelman).

DESCHAMPSIA FLEXUOSA

Ergot (Claviceps purpurea). A tr. was observed at Port aux Choix, Nfld. (Savile 3057). The host is probably highly resistant. The only record of ergot not for Deschampsia is its occurrence on D. caespitosa in Oregon by Sprague and by Weiss (D. B. O. Savile).

HIEROCHLOE ODORATA

Ergot (Claviceps purpurea). A trace was found at St. Anthony, Nfld. (Savile 2849). The only previous record on this host is from N. D. by Sprague (D. B. O. Savile).

HORDEUM JUBATUM

Stem Rust (Puccinia graminis). A trace infection of over-wintered uredinia was observed at Charlottetown, P. E. I. on 12 April. The viability of the spores was not checked, but previous repeated trials were without success. A trace was observed on the same host on 10 Aug. (R. R. Hurst). See also under Rye: Stem Rust.

IALARIS ARUNDINACEA

Rust (Puccinia sessilis). A trace was observed at Mavillette, N.S. (KP1666) . A. Harrison).

ILEUM PRATENSE - Timothy

Stem Rust (Puccinia graminis var. phlei-pratensis). Severe infections were served at Creston, B.C. (M.N. Grant), and in a field in Queens Co., P.E.I. .R. Hurst).

DA

Powdery Mildew (Erysiphe graminis). A sev. infection was observed on P. atensis at the University, Fort Garry, Man. (A.M. Brown).

Rust (Puccinia poae-sudeticae). Sl. infection on P. arida observed at acombe, Alta. (L.E. Tyner).

UCCINELLIA

Leaf Rust (Puccinia rubigo-vera). A 25% infection was seen at Canning, S., on P. maritima (KP1682) (D.W. Creelman).

PARTINA

Rusts (Uromyces acuminatus and Puccinia sparganioides). Both rusts were und heavily infecting S. pectinata at the Canning Dyke, Kings Co., and at Bridgeport, nnapolis Co., N.S. (KP1670 and 1672) (D.W. Creelman).

AWNS

Fairy Rings (Marasmius oreades) have become very common in lawns on the C. coast; the disease is sufficiently serious to require investigation with a view to s practical control (W.R. Foster).

III. DISEASES OF VEGETABLE AND FIELD CROPS

ASPARAGUS

RUST (Puccinia asparagi). A heavy infection of rust was found in a garden a Marshall, Sask. The rust was almost completely parasitized by Darluca filum (T. C. Vanterpool, I. L. Conners).

BEAN

GREY MOULD (Botrytis cinerea). Sl. infections were quite common in seve gardens at Ste. Anne de la Pocatiere, Que. (R. O. Lachance). Several cases were received by the Plant Protection Service. The earliest was on 14 Aug., when the disease was found causing damage to green beans on the market at Three Rivers; the pathogen was identified by the Laboratory at Ste. Anne de la Pocatiere (O. Carc Traces were found in every field examined in Kings and Annapolis Counties, N. S.; it is present wherever the growth is heavy and humidity high (K. A. Harrison). Infection was heavy on several varieties in gardens in Queens Co., P. E. I. (R. R. Hurst).

ANTHRACNOSE (Colletotrichum lindemuthianum). Infection was tr. in the plots at Edmonton (L. E. Tyner) and mod.-sev. in those at Lethbridge (M. W. Corm In beans of the Brittle Wax types grown for seed in the Laprairie area, Que., 2 fields contained 2% of the plants infected and 6 others were free of Anthracnose. In one field grown for the market at St. Martin, Laval Co., 80-90% of the crop wa infected and almost a total loss; the seed used was home grown (E. Lavallee). Tw fields of Black Seeded Pencil Pod planted with the same lot, which had been suppli by the canners, was a total loss on 18 August at West Paradise, N. S., whereas othe lots of seed of this and other varieties gave plants unaffected at this date (K. A. Harrison). In Cape Breton Co. infection in fields ranged from a tr. to 100% of the crop; the latter was in 1/2 acre field at Huntington (P. M. Grainger). Anthracnose was very destructive on wax beans in 1951, but the damage was less when home-grown seed was not used (R. R. Hurst). Infection was 50% in a garden plot of Improved Golden Wax at Topsail with small amounts in 2 gardens at Holyrood, Nfl (G. C. Morgan).

HALO BLIGHT (Pseudomonas phaseolicola) was present on 16 July on severa varieties in the test plots at the Station, Summerland, B. C.; its occurrence in the plot was apparently the result of sowing infected seed of Longreen, from which blight spread to the varieties, Idagreen, Plentiful, Ranger, Tendergreen, Supergre and Rival, following a heavy rain. Several varieties were found infected by halo bl in August in the B. C. Interior, including Grand Forks, Kelowna, and Vernon wher the crop was inspected under the Health Approval Plan by men of Plant Products Division (G. E. Woolliams). Infection was a tr. at Edmonton and sev. in plantings at Lacombe, Alta. (T. R. D.). The disease was general and sev. in several fields and gardens of garden varieties at Lethbridge; it was absent or a tr. in field beans (M. W. Cormack). Infection was mod. in several varieties at Fort Garry, Man. (W. A. F. Hagborg). Out of 8 fields of beans grown for seed in the Laprairie area,

e., infection was 15-20% in 3, and about 2% in 2, the other 5 fields were free the disease (E. Lavallee). The disease was general in Que. in 1951 (O. Caron). a 8-acre field of Improved Logan at Canan, N.S., infection was so severe that cres were ploughed down. The other 3 acres were sprayed with Bordeaux, but more than half a crop was harvested. This seed producing area has stopped owing beans following a second destructive outbreak (K. A. Harrison).

SCLEROTINIA ROT (Sclerotinia sclerotiorum) was very common in central a. on account of the moist conditions prevailing in 1951 (G. B. Sanford). A le rot was seen on stems and pods in a garden in Kings Co., N.S. Canners ported that there were cases of this disease developing in hampers of beans awaiting ocessing at the factory in Kentville (K. A. Harrison).

RUST (Uromyces appendiculatus). Rather heavily rusted specimens of lima an (DAOM 28381) were received from Wainfleet, Ont. (G. C. Chamberlain). This the first report of rust on lima bean in Canada (I. L. C.).

COMMON BLIGHT (Xanthomonas phaseoli). Infection was tr.-20% in the lds examined in Cape Breton Co., N.S. (P. M. Grainger). The disease affected % of the plants of Improved Golden Wax in a planting in Queens Co., P.E.I. cal gardeners also reported its presence (R. R. Hurst).

BACTERIAL BLIGHT (Xanthomonas phaseoli and Pseudomonas phaseolicola) fected 95% of the Clipper plants in a plot at Ottawa, Ont. (R. V. Clark). Some sev. fections were noted about Ste. Anne de la Pocatiere, Que., but when clean seed was ed infection was often slight (R. O. Lachance).

MOSAIC (virus) was found occasionally in the Grand Forks area, B.C.; a tr. s also present in the plots at the Station, Summerland (G. E. Woolliams). Traces mosaic were observed in many bean fields and gardens in the Montreal region, e. (E. Lavallee). Mosaic (Phaseolus virus 1) infection was 2% of the plants of ringless Green Pod and tr. of White Marrow Fat in 2 farm gardens in York Co. 2% infection was also found in 1/8 acre field of wax variety in Carleton Co., N.B. . J. MacLeod). Varying percentages of mosaic-infected plants were seen in verness, Victoria and Cape Breton Counties, N.S. (P. M. Grainger).

YELLOW MOSAIC (virus) affected the occasional plant in Grand Forks area, C., and found in several varieties in the plots at Summerland, B.C. (G. E. oolliams). Four Kentucky Wonder plants were found infected by yellow mosaic 2 farm gardens in York Co., N.B. The beans were planted near rows of gladioli at were affected with Phaseolus virus 2. The gladioli showed a faint mosaic ottle (D. J. MacLeod). Mosaic severely affected 5% of the Kentucky Wonder beans a small garden planting at Kentville, N.S., and the pods were useless; gladioli ere growing near the beans (K. A. Harrison).

SUNSCALD (non-parasitic) severely affected beans in 3 fields (about 6 acres) St. Urbain, and in a home garden at Ste. Martine, both in Chateauguay Co., Que. . Lavallee).

TIP BLIGHT (?non-parasitic) had caused mod. damage to a planting of Imperial Commander in Carleton Co., Ont. by 10 July; the plants were exposed to dry hot weather following a rain (K. M. Graham).

BEET

CROWN GALL (Agrobacterium tumefaciens) was general in one row in a hom garden at Vancouver, B. C.; the organism was isolated and identified (I. C. MacSwa W. E. McKeen).

LEAF SPOT (Cercospora beticola). Infection was mod. on several varieties in the Horticulture plots at Ottawa, Ont. (K. M. Graham). Infection was tr.-sev. garden beets across P. E. I. in September (R. R. Hurst).

DOWNY MILDEW (Peronospora schachtii). Some 50% of the seed plants of Detroit Dark Red were showing systemic infection on 16 May at the Station, Saanich B. C.; infection was widespread in the steckling crop in 1950 (W. Jones).

SCAB (Streptomyces scabies). Affected specimens grown in Queens Co., P. E. I. were brought in, infection was reported to be a trace (R. R. Hurst). Infecti was much lighter in Nfld. this year than in 1951; 5 fields (about 1/4 acre) at Conception Bay produced mod. infected roots (G. C. Morgan).

BROWN HEART (boron deficiency) caused sl. damage in a small well-limed garden in Charlottetown, P. E. I. (R. R. Hurst).

BROAD BEAN

LEAF SPOT (Cercospara fabae Fautrey). A 25% infection caused mod. dam to the leaves of broad bean (KP1712) growing on Tancook Island, N. S. This appear to be the first report for Canada (P. M. Grainger, D. Creelman). For a descriptio of the disease see R. C. Woodward, Trans. Brit. Myc. Soc. 17:195-201. 1932 (I. L.

BRUSSELS SPROUTS

WIRE STEM (Rhizoctonia solani). Affected specimens received from Windso N. S., 28 Sept., showed poor development of sprouts. The stem was girdled at or below ground level and in some the cortex was sloughed off; mycelium of R. solani was present (D. W. Creelman).

CABBAGE

GREY MOULD (Botrytis cinerea). Cabbage stored on the beams of a storage cellar at Barton, N. S., became completely covered by grey mould. Spores drifted down and caused a severe infection of swede turnips stored below (K. A. Harrison).

SOFT ROT (Erwinia carotovora) destroyed about 2 tons of cabbages in storag in 3 warehouses in St. John's, Nfld. The storage rooms were damp and unprotecte from frost (G. C. Morgan).

YELLOWS (Fusarium oxysporum f. conglutinans) was found in 4 fields of penhagen cabbages on the same farm at St. Vincent de Paul, Que. About 50% of e plants were more or less affected resulting in about 20% loss. Although the ower claims the disease has been present on his farm for 3 years, this is the st time that we have observed the disease in the Montreal district (E. Lavallee). lt infected 80% of the plants and caused severe damage in planting in the Hull strict; diseased plants were confined to that portion of the field that had been in ucifers the previous year (K. M. Graham).

DOWNY MILDEW (Peronospora brassicae). Sl. infection on the outer leaves Danish Ballhead at Logy Bay, Nfld. (G. C. Morgan).

BLACK LEG (Phoma lingam) infected about 25% of 50,000 plants being grown 4 seed beds in the Avalon Peninsula in 1951. The disease is troublesome every ar in Nfld. (G. C. Morgan).

CLUB ROOT (Plasmodiophora brassicae) continues to be the problem in the owing of cabbages and cauliflower in the Montreal district, Que., especially on le Jesus; this year frequent rains permitted a greater number of plants to survive d to produce heads than usual (E. Lavallee). Numerous affected specimens were ceived by the Plant Protection Service at Quebec (O. Caron). Traces of club root ere recorded at Upper Margaree, Inverness Co., at Huntington, Cape Breton Co., d on Tancook Island, Lunenburg Co., N.S. (P. M. Grainger). One case of severe mage to winter cabbage was reported in Queens Co., P. E. I.; a trace was found in other planting (R. R. Hurst). Club root is a serious disease in small garden plots many areas along the coast in Nfld. Heavy losses were noted in 25 home gardens . C. Morgan). According to the head gardener of the International Grenfell ssociation it was long a problem at St. Anthony, but it has been quite well controlled cently by a 3-year rotation (D. B. O. Savile).

WIRE STEM (Rhizoctonia solani). On account of adverse weather, wire stem as very severe on cabbage and cauliflower seedlings in beds in the Montreal strict, Que. Arasan-treated beds were free of disease, whereas many untreated ds had to be discarded (E. Lavallee).

BLACK ROT or BACTERIAL WILT (Xanthomonas campestris). The causal ganism was isolated from diseased cabbages from Strathroy, Ont. (E. H. Garrard).

CARROT

LEAF SPOT (Cercospora carotae). Carrot fields were uniformly defoliated in ngs and Annapolis Counties, N.S., causing 75% defoliation and average loss of % of the crop. In many fields the crop had made considerable growth before foliation occurred. In a few late sown fields, the crop was so poor that only part of e crop was harvested. (K. A. Harrison). This (DAOM 27327) appears to be the rst record of its occurrence in N.S. (I. L. Conners, J. A. Parmelee).

SOFT ROT (Erwinia carotovora). Four tons of roots from one grower began to break down badly after delivery to the wholesale merchant at Sydney, N.S., over 25% were affected on 24 Sept. (D.W. Creelman).

VIOLET ROOT ROT (Rhizoctonia crocorum). Caused mod. damage in harve carrots from a garden at Outlook, Sask. Its occurrence in this same garden was noted in 1949 (P.D.S. 29:42) (R.J. Ledingham).

BLACK ROT (Stemphylium radicinum) infected 5-20% of the stecklings set ou for seed production and caused the death of plants in some fields in the B.C. Interior (G.E. Woolliams).

BACTERIAL BLIGHT (Xanthomonas carotae) affected 5-10% of the plants in several seed-producing fields in the Grand Forks area, B.C. (G.E. Woolliams).

YELLOWS (Callistephus virus 1). A tr. was present on several varieties in the Horticulture plots, Ottawa, Ont. (K.M. Graham). The disease was common in Albert, Queens, Westmorland, Charlotte, Victoria and Madawaska Counties, N.B. infection was tr.-31%. In one home garden in York Co., 81% of the carrots were affected. Affected plants were often severely damaged (D.J. MacLeod). Yellows was less in evidence in Kings and Annapolis Counties, N.S., than usual. Possibly defoliation by the Cercospora leaf spot may have been a factor (K.A. Harrison). Yellows was observed in several gardens in Queens Co., P.E.I.; in one, all the plants were affected and severely damaged (R.R. Hurst). About 5% of the plants were affected in 5 fields in Conception Bay and 3 in Trinity Bay, Nfld. (G.C. Morg

CAULIFLOWER

SOFT ROT (Erwinia carotovora). A single sev.-affected plant was received from Queens Co., P.E.I. (R.R. Hurst).

YELLOWS (Fusarium oxysporum f. conglutinans) sev. injured 5-10% of the plants in a planting in Hull, Que. (K.M. Graham). See also under Cabbage.

CLUB ROOT (Plasmodiophora brassicae) caused sl. damage to 2% of the plants in a garden in Queens Co. P.E.I. (R.R. Hurst). The disease slightly infected six small plantings in the Conception Bay and Trinity Bay areas, Nfld. (G.C. Morgan).

BACTERIAL SPOT (Pseudomonas maculicola). Affected specimens were received from Montreal, Que., 25 Sept. (H.N. Racicot).

WIRE STEM (Rhizoctonia solani). A tr. was observed in flats of transplants in a few greenhouses in the Leamington area, Ont. (C.D. McKeen). A severe outbre occurred in part of a seed bed, about 15% of the plants dying at Glenmont, N.S. (K.A. Harrison). The disease affected 50% of the transplants in the same greenho in St. John's, Nfld., where last year it caused a 25% loss (G.C. Morgan).

BROWNING (boron deficiency) caused severe damage to the odd head in a rket garden in Queens Co., P. E. I. (R. R. Hurst).

CELERY

BROWN SPOT (Cephalosporium apii) of celery was found by W. B. Fox in a d of the green variety Salt Lake near Burlington Ont. It was first noticed as celery was being lifted for storage in early November. Damage was largely fined to an area 30 ft. in diameter. Specimens were sent to Ottawa, Toronto Guelph. Isolations were made and the organism independently identified as apii Smith & Ramsay (Bot. Gaz. 112(4):393-400. 1951). Since these authors ytopathology 38(1):23. 1948) first observed the disease in green pascal celery m Colorado in 1943, brown spot has been reported in New York State by R. Segall S. D. A. Pl. Dis. Reporter 35(3):164. 1951), who found it there in 1949 but not in 50 (K. M. Graham, B. H. MacNeill). It should be noted isolations received from D. L. Bailey produced chlamydospores in culture as described by the authors, the Ottawa isolations failed to do so. The disease has not been recognised ewhere, but J. K. Richardson reported a mod. infection of early blight (Cercospora i) and a tr. of late blight (Septoria apii) in one planting of Salt Lake in Lincoln Co. s year. Moreover, the same author recorded in 1944 "A moderate infection of ly blight developed late in the season in the Laboratory plots, St. Catharines, late blight was not observed", (P. D. S. 24:44) and when the original record was ecked it was found that the variety was given as "Salt Lake". It may be only ncidence that Salt Lake was the variety upon which the early blight was reported, because brown spot may be easily confused with the former disease, infected terial, particularly of the green pascal varieties, should be examined under the secting microscope when it reaches the laboratory or after holding over night a moist chamber. The Cephalosporium heads are quite distinct from the tufts conidiophores and conidia of Cercospora (I. L. Conners).

EARLY BLIGHT (Cercospora apii) was prevalent on 3 neighbouring farms on ck soil at Ste. Dorothee, Laval Co. Que. Dusting with fixed coppers kept the ease under fairly good control (E. Lavallee).

SOFT ROT (Erwinia aroideae). Plants received from the Thedford district, t., showed pronounced rot in the roots. Infection was reported to have been quite ere. Although it was not proved that the rot was entirely due to bacteria, the e of rot was typical and repeated tests resulted in the isolation of E. aroideae H. Garrard).

SOFT ROT (Erwinia carotovora) affected the fleshy tap root and crown of ttered plants, possibly following insect injury, in a field at Kelowna, B. C. E. Woolliams).

LATE BLIGHT (Septoria apii-graveolentis). Owing to a very dry growing season, e blight was not observed in fields where it has been present in previous years in Kelowna district, B. C. (G. E. Woolliams). A very severe infection was seen in ommercial planting at Edmonton, Alta. (L. E. Tyner). Late blight was quite

general in Lincoln Co., Ont., but it was only a problem where the applications of fungicide were inadequate (J. K. Richardson). It caused a heavy infection in one small field at Leamington (C. D. McKeen). Late blight was present in most celery beds and in all fields visited in Laval Co., Que. The level of infection and the am of damage was greater than usual (E. Lavallee).

YELLOWS (Callistephus virus 1, Western strain). A tr. was found in 2 field in Sunbury Co. and in a garden in York Co., N. B. (D. J. MacLeod).

FROST DAMAGE. A sharp frost in early October destroyed several thousan unharvested crates of late celery in the Kelowna area, B. C. (G. E. Woolliams.)

CHINESE CABBAGE

CLUB ROOT (Plasmodiophora brassicae). "My oriental cabbage all died this summer" wrote M. Yoshida, Cap St. Martin, Que. Specimens revealed that the cause was club root (H. N. Racicot).

CUCUMBER

LEAF SPOT (Alternaria sp.). Infection was heavy in a garden, at Watervill N. S., where cucumbers had been grown for several years; the disease was not evident in nearby fields under regular rotation (D. W. Creelman).

FRUIT ROT (Alternaria sp.). A few fruits were severely affected and cover with a sporulating growth of Alternaria (K. M. Graham).

GREY MOULD (Botrytis cinerea). As in former years, grey mould appeare in several greenhouses in Essex Co., Ont., from March to May. Although blosso and fruits are attacked, the stem rot phase is the serious one, losses in 1951 rang up to 8% of the crop. Growers, who spray periodically with ferbam have prevente the disease becoming established in their greenhouses (C. D. McKeen).

SCAB (Cladosporium cucumerinum) was present as usual in both greenhouse and field crops in Essex Co., Ont., but the damage caused was negligible (C. D. McKeen). In the Montreal district, Que., scab was unusually severe. On account of the epidemic most fields contained no sound fruit by the end of August (E. Lavall The crop was a total loss in two gardens at Ste. Anne de la Pocatiere in July (R. O. Lachance). Scab was very prevalent this season in the Maugerville and Grand Lake areas, N. B. In some plantings 50% of the fruit were unsaleable (J. L. Howatt). Grading stations found that scab was severe in a few fields of pickling cucumber in Kings Co., N. S., by mid-September. This is the first out- break in the newly-developed cucumber area and if the disease were to start earli in the season it would be very serious (K. A. Harrison). Scab became very destru in fields of Chicago Pickle across P. E. I. by 10 Sept. Because of the susceptibilit of this variety to scab it is proposed to discontinue its growing commercially and to replace it in 1952 by Maine No. 2, which has so far proven immune to the disea (R. R. Hurst).

ANTHRACNOSE (Colletotrichum lagenarium) and COTTONY LEAK (Pythium hanidermatum) were each affecting about 25% of a carload of cucumbers from kansas when examined in Montreal on 11 July (J. E. Jacques).

BACTERIAL WILT (Erwinia tracheiphila) appeared to be more prevalent than ual. Specimens received from Strathroy, Ospringe, Guelph, Hamilton and kville, and from St. Isadore, Que. were found affected by the disease. The usal organism was also isolated from a melon plant received from Highland Creek, t., (E. H. Garrard). Some 3-4% of the plants were destroyed in several early cumber fields in Essex Co. (C. D. McKeen).

POWDERY MILDEW (Erysiphe cichoracearum). A sl. infection was observed a few stems of Niagara and Sure Crops in the University plots, Vancouver, B. C. .N. W. Toms). Powdery Mildew was less severe in greenhouse crops in Essex ., Ont., than in some recent years. It appeared near the end of the harvesting riod in many fields crops at Harrow (C. D. McKeen). The disease was general d caused a marked reduction in yield in a several acre planting of pickling cumbers in Norfolk Co. (G. C. Chamberlain).

FOOT ROT (prob. Fusarium, Pythium, etc.) was encountered in many green- use crops where the soil had not been steamed for one or more seasons. Losses out Leamington, Ont., varied from a tr. to 4% (C. D. McKeen).

WILT (Mycosphaerella citrulina). Only a tr. was seen in one greenhouse crop Essex Co., in 1951 (C. D. McKeen).

ANGULAR LEAF SPOT (Pseudomonas lachrymans). A sl. leaf infection was served in 3 commercial plantings at Medicine Hat, Alta.; the fruit was unaffected I. W. Cormack). A sev. infection was observed at St. Eustache, Man. (W. A. F. gborg). The disease caused extensive foliage damage in a 2-acre field crop at rrow, Ont. (C. D. McKeen).

WILT (Pythium spp., Fusarium spp.) caused severe damage in many gardens Sask. in late August following a prolonged period of cool wet weather. At the ation, Scott, cucumbers, muskmelons and watermelons were virtually wiped out August and the Stations at Melfort and Swift Current reported severe damage . J. Ledingham).

STEM ROT (Sclerotinia sclerotiorum) became prevalent in one greenhouse at eamington, Ont. The fungus was found fruiting abundantly on sucker growth that d been broken off and left lying on the soil. A few stems were attacked at the des near the ground line. As soon as the disease was observed, the crop was rayed twice with ferbam; the disease was arrested and only 10 plants were stroyed (C. D. McKeen).

WILT (Verticillium albo-atrum) was affecting about 10% of the plants of arketer and Cubit in a field at Kamloops, B. C. on 31 July (G. E. Woolliams).

MOSAIC (virus). No crops were affected by mosaic in the Leamington area, Ont., in 1951. The growing of highly resistant varieties in recent years has relegated this disease to one of little importance in either greenhouse or field crops in Essex Co. (C. D. McKeen). A trace was observed in planting in Sunbury Co., N. B. (D. J. MacLeod). Infection was heavy in a field of Chicago Pickle and other varieties in Queens Co., P. E. I. (R. R. Hurst).

EGGPLANT

WILT (Verticillium albo-atrum) was observed in a plot of eggplant at Summerland, B. C.; the pathogen was isolated (G. E. Woolliams). The odd plant was severely affected in the Horticulture plots, Ottawa, Ont. It also caused sev. damage in 5-10% of the plants in a planting in Hull, Que. (K. M. Graham).

LEAF YELLOWING and WILT (?virus). Both in 1950 and 1951 several small plots of eggplant near Harrow, Ont., have shown a yellowing and wilting of the leaves and a stunting of the plant. These plants lack the symptoms of Verticillium wilt and preliminary investigations have indicated that trouble is caused by a virus (C. D. McKeen).

GARLIC

WHITE ROT (Sclerotium cepivorum Berk.) was found causing considerable damage in patches in a small planting (100 ft. x 75 ft.) at Steveston, B. C. The garden area was situated between the crowded habitations of the Chinese fishing settlement and probably has been cultivated for 40 years. The fungus was isolated and its identity confirmed in Ottawa. As this appears to be the first record of the occurrence of the disease in Canada, the owner agreed to destroy all plants not nee for his own use and to refrain from growing a susceptible crop on this ground for several years (I. C. MacSwan, W. Jones). Because of the similarity of the climate on the coast of B. C. to that in many parts of Europe it is possible that white rot could become of some importance in B. C. The disease is known in the United State but after careful investigation it was considered to be of minor importance (I. L. C.)

GINSENG

DISAPPEARING ROT (Cylindrocarpon spp.). A grower at Middle Church, Ma lost his entire crop of 20,000 plants from the disease, which was identified by Dr. A. A. Hildebrand (B. Peturson, W. L. Gordon).

HOPS

ROOT ROT (cause uncertain) moderately infected hops growing at the Sub-Station, Fournier, Ont., causing severe damage to the individual plants. A species of Cydindrocarpon was isolated (K. M. Graham).

HORSERADISH

WHITE RUST (Cystopus candidus) was very prevalent on a planting of horse-
dish at St. Catharines, Ont. on 7 Aug. ; leaves were distorted and the growth
thrifty (G. C. Chamberlain).

LETTUCE

MARGINAL LEAF SPOT (Pseudomonas marginalis). Infection was severe at
randon, Man. on 27 July (W. A. F. Hagborg). A typical sample of bacterial rot of
ttuce was submitted from Bloomfield, Ont. (E. H. Garrard).

DROP (Sclerotinia sclerotiorum) caused mod. damage at the Station, Melfort,
sk. (H. W. M.). Numerous fields were affected in the Montreal district, Que.
s the average infection was about 30%, damage was heavy. The weather was cool
d wet (E. Lavallee). The disease caused a 1% loss in a planting at Ste. Anne de
Pocatiere (R. O. Lachance). Probably the same disease caused a 10-20% loss
several varieties in the University plots, Vancouver, B. C. (H. N. W. Toms).

MOSAIC (virus) mod. infected a few plants in a planting of Great Lakes in
arleton Co. , Ont. (K. M. Graham).

YELLOWS (Callistephus virus 1) was common in gardens in York and Sunbury
ounties, N. B. ; infection was tr. -7% (D. J. MacLeod).

MELON

LEAF SPOT (Alternaria cucumerina). A mod. infection was observed in
everal fields in the Leamington area, Ont. , towards the close of the harvesting
eriod (C. D. McKeen).

SCAB (Cladosporium cucumerinum). A 2-acre field of early melons in Essex
o. , Ont. were almost a total loss on account of a severe outbreak of scab. Large
emishes appeared on the developing fruits as well as long lesions on the stems,
lling the terminal growth (C. D. McKeen).

ANTHRACNOSE (Colletotrichum lagenarium) developed on several varieties
a plot at the Laboratory, Harrow, Ont. , causing lesions on the stem, leaves and
uits; the disease completely destroyed the crop in a 8-acre field near London
. D. McKeen).

WILT (Fusarium bulbigenum var. niveum). In many fields in the Harrow-
eamington area the soil of which is known to be infested by the pathogen, heavy
sses were suffered when wilt-susceptible varieties were planted. The variety
oquois still shows complete resistance to wilt in this area, although it has been
eported susceptible elsewhere in Ont. (C. D. McKeen). In an acre field in Lincoln
o. , Ont. , about 10% of the plants were affected when examined in July and the
sease appeared to be still increasing (J. K. Richardson).

WILT (Verticillium albo-atrum) affected 10-25% in plantings of Hales Best cantaloupe in the Kelowna and Osoyoos areas, B. C., the pathogen was isolated fro plants growing in both areas (G. E. Woolliams).

MOSAIC (virus). Virtually all the melon fields at Leamington, Ont., showed a high incidence of mosaic. Large populations of the cotton aphid, Aphis gossypii, were found in these fields and were presumably responsible for the spread of the cucumber mosaic virus (C. D. McKeen).

BREAKDOWN (cause unknown) is a serious problem in commercial cantaloup growing in the Osoyoos district, B. C. A few fields were free of the trouble, but in most fields it caused serious loss and in a few 75% or more of the fruit were unsaleable (G. E. Woolliams).

ONION

NECK ROT (Botrytis allii) was present on bulbs of Yellow Globe Danvers, Ebenezer, etc., in common storage in March throughout the B. C. Interior. Losse varied with the area and storage house, ranging from 2-25% (G. E. Woolliams). A sl. infection was observed in a commercial field at Medicine Hat, Alta.; several reports were received of damage to stored bulbs (M. W. Cormack). The pathogen was the only organism isolated from specimens from Churchill, Man., brought in Dorothy K. Brown, Botanist, National Defence Board, who stated that onions grow from sets became decayed, whereas those grown from seed, at Churchill, were sound (H. N. Racicot). As usual, neck rot caused damage to stored bulbs in s. w. Ont., but no extensive losses were reported (C. D. McKeen). About 3% of the onions in a carload of the 1951 crop grown on the Holland Marsh were found affecte when inspected in Montreal on March 3 (H. N. Racicot). Neck rot was severe in re onions in storage warehouses in Que. in January 1951. The onions appeared not to have been ripe when harvested and were improperly cured. Complaints have alrea been received concerning the 1951 crop (O. Caron).

DOWNY MILDEW (Peronospora destructor) caused a 5% systemic infection in a seed crop of White Portugal at the Station, Saanichton, B. C. Affected plants were dwarfed and a paler colour than healthy plants on 16 May. The disease was general in the 1950 crop that produced the sets (W. Jones). Owing to a dry growing season downy mildew, usually quite heavy on the seed crop in recent years was only a trace in the B. C. Interior in 1951. In one field of Silverskin at Kelowna infection covered a 15-20 foot circle in a 1/2 acre field before dry weather halted its spread (G. E. Woolliams). The disease was severe in a field containing several varieties near Ottawa, Ont. on 1 Aug. (K. M. Graham). Most onion fields in the Montreal area, Que., were affected by 1 Aug. Infection was almost 100% and loss was estimated at 30% of the crop. The epidemic was heaviest for many years (E. Lava

PINK ROT (Pyrenochaeta terrestris) was prevalent on onions in many fields located on muck soils at Leamington, Ont. The disease has been found to affect the same areas in the fields year after year (C. D. McKeen).

SMUT (Urocystis cepulae) was confined to a small part of a commercial field Yellow Globe Danvers at Kelowna, B. C. According to the grower a small amount onion smut was present in the same field 10-12 years ago. He also claims that soil in the affected part is alkaline and the onion plants are not quite so thrifty in the rest of the field (G. E. Woolliams). A very light infection developed on on seedlings grown from Dutch sets in Bosanquit Twp., Lambton Co., Ont. The l was treated with formalin, as the seed was sown, but control was not complete. B. Kelly). Smut was severe in several fields in s. w. Que., especially around . Clothilde, Chateauguay Co. Also in one field at St. Cesaire, Rouville Co., ery plant was affected (L. Cinq-Mars).

YELLOWS (Callistephus virus 1) was found affecting an occasional plant in eral fields planted for seed in the Grand Forks area, B. C. (G. E. Woolliams).

STORAGE BREAKDOWN. An estimated 23% of the bulbs in a carlot of onions own in the Holland Marsh, Ont., showed a physiological breakdown when examined 6 March in Montreal. Some of the scales were brown but free from micro-ganisms. The onions were rather soft and spongy as if they had been grown very idly and were immature when harvested. A small amount of neck rot (q. v.) was o present (H. N. Racicot).

PARSNIP

SCAB (Streptomyces scabies) heavily infected a planting of parsnips in eens Co., P. E. I. (R. R. Hurst).

YELLOWS (Callistephus virus 1) infected a tr. and 0. 5% of the plants in ardens in York Co., N. B. (D. J. MacLeod).

PEA

LEAF and POD SPOT (Ascochyta pisi). Sl. -mod. infections were observed at ooks, Lethbridge, and Medicine Hat, Alta. (M. W. Cormack). Infection was sl. - . in the plots at Edmonton (S. G. Fushtey). Traces were recorded on some ieties and strains in the plots at Charlottetown, P. E. I. (J. E. Campbell).

POWDERY MILDEW (Erysiphe polygoni). A sl. infection was recorded on derman in the Univ. plots, Vancouver, B. C. (H. N. W. Toms). Infection was sl. fields and plots at Lethbridge (M. W. Cormack), and tr. -sl. at Edmonton G. Fushtey). Infection was sev. on most varieties in Sept. in the plots at arlottetown, P. E. I. (J. E. Campbell).

ROOT ROT (Fusarium spp.) destroyed all the plants in low spots in a field Chancellor at Ste. Anne de la Pocatiere, Que. (R. O. Lachance). The disease s very common at Kentville in gardens where peas have been grown previously. one garden patch 20% of the plants died (K. A. Harrison).

MYCOSPHAERELLA BLIGHT (M. pinodes). A survey of field peas in the Portage la Prairie, Poplar Point, and St. Eustache districts in Man. on 9-10 August revealed blight in all 17 fields examined (7 Arthur and 10 Dashaway). Infection varied from a trace to 8% of the leaf surface. Early fields probably escaped damage, but late fields would have suffered considerable reduction in yie Ascochyta pinodes was isolated from 11 out of 13 collections of lesioned leaves (W. A. F. Hagborg).

BACTERIAL BLIGHT (Pseudomanas pisi). Infection was a tr. at Meadows and Morris, Man., and sev. in patches at Portage la Prairie and St. Eustache (W. A. F. Hagborg).

DOWNY MILDEW (Peronospora pisi) was found on the basal leaves of an occasional plant in a 5-acre field of Gradah peas being grown for seed at Mara, B. C. (G. E. Woolliams). A mod. infection was observed in a field at Taber, Alta in July (F. R. Harper).

ROOT ROT (Rhizoctonia solani and other fungi). Infection was tr. -mod. in 5 fields in the Coaldale-Taber area, Alta. (F. R. Harper).

RUST (Uromyces fabae). All plants were infected in a small patch in a late sowing at Kentville, N. S. (K. A. H.) Tr. observed on American Wonder in a planti in Queens Co., P. E. I. (R. R. Hurst).

MOSAIC (virus) affected 15-20% of the plants in a home garden at South Burnaby, B. C.; a single plant was seen in the test plots at the University, Vancou (H. N. W. Toms). Mosaic (Pisum virus 1) infection was tr. -6% in gardens and fields in York and Sunbury Counties, N. B. (D. J. MacLeod).

ROOT ROT (various fungi). Fields of canning peas were quite severely affected in St. Jean, Napierville, and Chateauguay Counties, Que. Many fields were a total loss. The spring was cool and rains heavy (E. Lavallee).

PEPPER

GREY MOULD (Botrytis cinerea). A general infection appeared in plots of seedlings in one greenhouse at Harrow, Ont. The tips of the cotyledons were attacked and the fungus fruited abundantly thereon. Only a few seedlings were killed. The disease was arrested by applying a ferbam spray (C. D. McKeen).

SOFT ROT (Erwinia carotovora). Several bushels of peppers from a farm at Harrow, Ont., were reported to be showing considerable soft rot when the peppers arrived on the Toronto market. Corn-borer larvae had burrowed in the fruits about the peduncle; insect damage was unnoticed when the peppers were shipped. Soft rot develops in such wounds and under certain conditions rapidly destroys the fruit (C. D. McKeen).

DAMPING-OFF (Pythium spp. and Rhizoctonia solani). Traces were observed few greenhouses at Harrow, Ont., losses did not exceed 5% in any greenhouse. ngus identified as Aphanomyces cladogamus Drechsler (Jour. Agr. Res. 38:335.), was isolated from some 5% of the damped-off seedlings in one greenhouse. eriments revealed that it was capable of causing the death of the seedling before fter its emergence. A paper describing the fungus and its pathogenicity is g prepared (C. D. McKeen).

LATE DAMPING-OFF (Rhizoctonia solani) developed in small spots in a few at Harrow, Ont. The use of Arasan as a soil fungicide has markedly reduced osses caused by R. solani in recent years (C. D. McKeen).

VERTICILLIUM WILT (V. albo-atrum). Infection was often heavy on peppers ie Okanagan Valley, B. C. in 1951. The pathogen was isolated from affected ts from several places including Summerland, Kelowna, and Vernon. The ogen was also isolated from the weeds Chenopodium album, Solanum sarachoides Xanthium canadense on a farm at Vernon (G. E. Woolliams). See also under ato.

BACTERIAL SPOT (Xanthomonas vesicatoria) was found in about 25% of the ls in the Harrow area, Ont. It caused defoliation and stunting of plants early ie season, but the plants outgrew the disease and produced a heavy crop with few s bearing spots later in the season (C. D. McKeen).

STREAK (Solanum virus 1, S strain). Two plants showing a severe streak e found in a field in Sunbury Co., N. B. (D. J. MacLeod).

The virus diseases, TOBACCO ETCH, CUCUMBER MOSAIC and TOBACCO SAIC were again epidemic in the pepper growing area about Harrow, Ont. All e virus diseases were identified. The green peach aphid, Myzus persicae, was chief vector causing the spread of tobacco etch and cucumber mosaic. Losses ed from 5% to 70% in the affected fields (C. D. McKeen). A 10% infection was erved in a 1/4 acre planting of Hamilton Market in Lincoln Co. (J. K. Richardson).

BLOSSOM-END ROT (non-parasitic). Specimens showing blossom-end rot e received from a Chinese market garden, Steveston, Lulu Island, B. C., in 1950 P. D. S. 30:63). Isolations were made from the affected tissue. Stemphylium sortiale (Thüm.) Groves & Skolko, apparently a weak parasite, was isolated from in the fruit (H. N. W. Toms, J. W. Groves). The disorder appeared in August ll pepper fields observed in Essex Co., Ont.; losses were light (C. D. McKeen).

POTATO

The Division of Plant Protection, Science Service, has again supplied the in Tables 4-7 on Seed Potato Certification. All fields entered for certification e planted with Foundation or Foundation A seed.

Table 4. Seed Potato Certification:
Fields and Acres Inspected and Passed in 1951

	Number of Fields		Fields Passed %	Number of Acres		Acres Passe %
	Entered	Passed		Entered	Passed	
P. E. I.	5,871	5,209	88.7	21,771.5	19,502.0	89.6
N. S.	387	352	91.0	659.5	596.2	90.4
N. B.	3,074	2,888	93.9	15,542.8	14,159.7	91.1
Que.	1,035	617	59.6	2,738.6	1,488.6	54.4
Ont.	677	578	85.4	2,105.5	1,786.9	84.9
Man.	128	111	86.7	572.0	462.0	80.9
Sask.	53	47	88.7	93.7	76.4	81.5
Alta.	212	183	86.3	924.5	731.7	79.1
B. C.	656	595	90.7	1,767.9	1,598.8	90.4
Total	12,093	10,580	87.5	46,176.0	40,402.3	87.5
Previous Yearly Totals						
1950	16,203	13,292	82.0	75,352	61,933	82.2
1949	15,476	13,739	88.8	72,706	65,051	89.5
1948	15,635	12,504	80.0	70,561	57,392	81.3
1947	14,616	12,605	86.2	60,385	53,474	88.6

Acres Entered		Acres Passed	
1951	46,176	1951	40,402
1950	75,352	1950	61,933
Decrease of 29,176 or 39%		Decrease of 21,531 or 35%	

In 1945, the last year of World War II, there was a very large increase in the acreage entered for Seed Potato Certification. Comparison of figures given in Table 5 with those given in 1947 (P. D. S. 27:57) show that these levels have been increasing or at least maintained until the present year, when the acreage fell somewhat below that planted in 1945. This curtailment was a direct result of the poor potato prices the previous year. The percentage of fields rejected on account of disease is much higher in Que. than elsewhere, being 40%, whereas the average for the rest of Canada was 10%. In that province ring rot alone caused the rejection of 22% of the fields on account of ring rot in the field or on the farm.

ato

Table 5. Seed Potato Certification
Acreage Passed by Varieties

iety	P. E. I.	N. S.	N. B.	Que.	Ont.	Man.-Alta.	B. C.	Total
ahdin	2135. 5	140. 6	9392. 0	52. 3	1208. 5	26. 0	11. 3	12966. 2
ago	9260. 3	50. 6	317. 0		46. 1	1. 1	6. 0	9681. 1
h Cobbler	4550. 0	73. 7	807. 0	66. 6	123. 9	64. 5		5685. 7
en								
ıntain	2644. 0	87. 1	1263. 0	1344. 2	31. 9	20. 0	83. 6	5473. 8
ted Gem	61. 0	23. 8	85. 0	1. 0	1. 2	723. 3	1068. 1	1963. 4
ss Triumph	82. 0	133. 8	1252. 0			43. 4		1511. 2
tiac	475. 0	2. 3	659. 0			88. 0	2. 2	1226. 5
rba	52. 3	10. 5	11. 0	1. 2	11. 0	139. 4	145. 5	370. 9
ppewa	38. 5	25. 0	75. 0		226. 2	0. 2	4. 2	369. 1
so	92. 5	18. 5	79. 0	14. 0	49. 0	18. 0	13. 0	284. 0
te Rose			95. 0					117. 8
al Russet			90. 5		54. 5			145. 0
swick	41. 7	3. 3	27. 7	9. 3	5. 2	5. 0	6. 7	98. 9
ly Epicure	1. 5						84. 3	85. 8
ers*	67. 7	27. 0	6. 5		29. 4	141. 2	56. 1	327. 9
al	19502. 0	596. 2	14159. 7	1488. 6	1786. 9	1270. 1	1598. 8	40402. 3

nese varieties with the acreage of each were: Early Ohio 62. 7, Sequoia 57. 5, umbia Russet 49. 2, Canus 43. 3, Kennebec 21. 7, Early Rose 21. 1, Rural New ker (Dooley) 13. 1, McIntyre 10. 9, Garnet Chili 8. 8, Great Scot 8. 3, Mohawk 7. 8, nee 5. 7, Gold Coin 5. 6, Burbank 4. 8, Carter's Early Favorite 4. 4, Sir Walter eigh 1. 0, Arran Victory 0. 9, Up-to-Date 0. 5, Wee McGregor 0. 5, and Clarks #3

EARLY BLIGHT (Alternaria solani) was observed in only 10. 7% of the 565 ds inspected in B. C. For a second year infection was low, never being more mod. in individual fields (H. S. MacLeod). The disease became general in tral and n. Alta. infection being sl. -mod. at Edmonton and Lacombe; it was erved as far south as Calgary in August. As it is unnecessary to spray for late ht or Colorado beetle in n. Alta., no spraying is done. In the last few years the a affected by early blight has increased as well as the severity of infection it be necessary to spray (J. W. Marritt, T. R. Davidson). Early blight was rather in Sask. in 1951 and undoubtedly was responsible for some reduction in yield otatoes (R. J. Ledingham). Sev. defoliation of some early varieties occurred by August at Saskatoon, Prince Albert, and Norquay (A. Charlebois). Infection was -mod. on early varieties about Winnipeg and Brandon in August and mod. -sev. in ny areas in Man. in early September if the crop had not been adequately protected ungicides (D. J. Petty).

Table 6. Seed Potato Certification: Fields Rejected on Field Inspection, 1951

Province	Leaf Roll	Mosaic	Ring Rot in field	Ring Rot on farm	Black Leg	Wilts	Adjacent Diseased Fields	Foreign Var.	Misc.	Total
P. E. I.	36	200	-	-	131	31	32	80	152	662
N. S.	2	11	-	-	4	-	2	9	7	35
N. B.	27	60	42	7	11	-	10	24	5	186
Que.	6	80	162	65	52	-	19	14	20	418
Ont.	15	17	17	9	9	6	4	8	14	99
Man.	4		3	2	1	1	--	--	6	17
Sask.	--	1	--	-	3	1	--	--	1	6
Alta.	3	--	--	-	21	2	1	--	2	29
B. C.	6	--	--	-	2	--	5	4	44	61
Total	99	369	224	83	234	41	73	139	251	1,513
Rejections as a percentage of fields:										
Entered	0.8	3.1	1.8	0.7	1.9	0.3	0.6	1.2	2.1	12.5
Rejected	6.5	24.4	14.8	5.5	15.5	2.7	4.8	9.2	16.6	100

Table 7. Seed Potato Certification: Average Percentages of Diseases found in Fields, 1951

Average percentage of disease found in	P. E. I.	N. S.	N. B.	Que.	Ont.	Man.	Sask.	Alta.	B. C
	%	%	%	%	%	%	%	%	%
Fields entered: (first inspection)									
Black Leg	.33	.06	.09	.25	.04	.07	.13	.44	.06
Leaf Roll	.11	.04	.08	.03	.04	.02	.11	.06	.04
Mosaic	.21	.09	.16	.21	.07	.01	.14	.01	.01
Fields passed (final inspection)									
Black Leg	.15	.04	.08	.09	.03	.02	.01	.08	.03
Leaf Roll	.04	.04	.06	.03	.04	.00	.06	.02	.01
Mosaic	.04	.07	.11	.04	.06	.01	.03	.00	.00

Early blight infection was generally light throughout s.w. Ont. (F. J. Hudson, S. Kemp). About Harrow, the disease occurred in 1951, as in recent years, ly tr. amounts in most fields (C. D. McKeen). In district 3, early blight was rally less prevalent than in 1950. Even Keswick and Canso, which were rely affected in that year, were only lightly infected in 1951. Early blight was y prevalent in central and e. Ont. and w. Que. Keswick seems quite susceptible rly blight and insect injury. Because of its minor nature, it is unlikely any ers spray or dust to control it specifically (E. H. Peters). Early blight was in 27. 6% of 1035 fields inspected in Que. ; infection was usually sl. -mod. except ields, one being Canso, where the disease was sev. Late infection was noted e lower St. Lawrence and Lake St. John districts (B. Baribeau). Early blight bbserved in all parts of N. B. , but infection was usually only sl. except in a Canso fields, which were sev. infected. Tuber rot was rarely observed during vinter season and the loss negligible (C. H. Godwin). Early blight was sev. in in some fields of Keswick and Canso, which were not sprayed (J. L. Howatt.) infection was noted in N. S. in most fields of early varieties by mid-August, irst report being on 24 July in the Scotts Bay area of Kings Co. The disease ably never developed fully because late blight became epidemic early in the on (R. C. Layton). Early blight again caused only the lightest of infections in I. (H. L. McLaren). A light infection was fairly widespread on potatoes in (G. C. Morgan).

GREY MOULD (Botrytis cinerea). A sl. infection was observed at Ste. Anne Pocatiere, Que. The lesions can easily be mistaken for those of early blight Payette). About 25% of the plants were severely affected in a small area of a in Queens Co. , P. E. I. (R. R. Hurst).

BLACK DOT (Colletotrichum atramentarium) was observed in a garden at onton, Alta. (A. W. Henry).

BACTERIAL RING ROT (Corynebacterium sepedonicum) was found in April for the first time in a crop grown for certification from seed produced in B. C. r inspection also revealed the disease in two other crops, but they had been ed with seed produced elsewhere in Canada. No ring rot was found during field ection of the 1951 crop. However, 7 cases of the disease have been reported C. in table stock potatoes at widely separated points, 5 being in fields of nercial growers. The 10 farms on which affected crops were grown in 1950 he 4 farms to which the disease may have been spread were inspected at harvest all were found free of ring rot. A similar inspection of the Pemberton Seed rol area also revealed no ring rot (H. S. MacLeod, W. R. Foster). Four carlots mmercial potatoes imported into B. C. were found affected: 1 each from U. S. A. Ont. and 2 from Alta. (W. Jones).

Although the crop was slow maturing in Alta. in 1951, the symptoms of erial ring rot were advanced and well defined in all fields where the disease found. Of the 7473 acres of potatoes on 771 farms inspected in the pest control s of Edmonton, Calgary, Brooks and Lethbridge ring rot affected 474 acres 9 farms. Thus, ring-rot incidence was reduced considerably as the percentage spected farms upon which ring rot was found decreased from 10. 5% in 1950 to

7.7% in 1951. Moreover, the survey has not only reduced the incidence of ring r in Alta., but it has also contributed considerably to an improvement in the quality of potatoes being grown in the province (W. Lobay). No ring rot was found in fiel entered for certification in Alta. (J. W. Marritt).

Ring rot was not found in seed potato fields in Sask. but sl.-mod. infections were seen in table potatoes grown at Lumsden. It was also severe in a field of Irish Cobbler for table use in the Pike Lake district (A. Charlebois). Fewer specimens of ring-rot infected tubers than usual were received this fall at Saskato (R. J. Ledingham). A trace of ring rot was found in 3 fields in Man. and 2 other fields were also rejected because of the disease in the same stock (D. J. Petty).

Ring rot was found in 3 fields in the London district, Ont., and because of it presence in them, 6 additional fields were refused certification (F. J. Hudson). N ring rot was found in district 2 (W. L. S. Kemp). In all 16 fields (40.6 acres), chi of Katahdin, were rejected for ring rot in district 3. Infection in most fields was very low except in one of Green Mountain at North Bay. The explanation for its high incidence appears to be that the organism may have been carried from other fields in the area by pickers who used their own equipment to harvest the 1950 cro To combat the disease all growers were advised by circular before harvest and planting of the importance of disinfecting all machinery and storage space. The staff supervised the disinfection of 36 farm storage spaces and advised on disinfec of harvesting equipment (H. W. Whiteside). One small field of Canso was rejected for ring rot in e. Ont. (O. W. Lachaine). No information is available on the numbe of fields inspected during the annual survey in Ont. in 1951. Of the 154 samples submitted 125 were found to be positive and it would appear that ring rot was less prevalent than in 1950. However, of the 125 farms found to be infected in 1951, 40 farms (32%) had been infected previously. Of the 40, 11 were infected for 2, 6 for 3, and one for 4 consecutive years (H. N. Racicot).

Ring rot was found in 162 fields (15.8%) of the 1035 entered for certification in 1951 in Que. compared with 10% in 1950. Lack of disinfection and the use of second-hand bags is believed to allow the disease to persist. A 1-5% infection wa noted in 3 fields of Canso. On many farms, where Teton is grown instead of other varieties, ring rot has disappeared completely (B. Baribeau). Ring rot was again the major cause of rejection in N. B. although it was less prevalent than in 1950. Of the 3,074 fields inspected in 1951, 49 (1.5%) were rejected (C. H. Godwin). Because late blight was epidemic in N. S. ring rot was not easy to diagnose this yea No ring rot was observed in any seed crop. The only farm on which ring rot was found was one of a former grower of certified seed, whose crop was affected in 1950; only a tr. was present (R. C. Layton). Bacterial ring rot has not been found in the 1951 crop in P. E. I. However, 5 cases were found in table stock of the 1950 crop early in the year. The source of infection is unknown but it is suspected that it came from second-hand bags brought into the province and used by one of the growers (H. L. McLaren).

SOFT ROT (?Erwinia carotovora). Several specimens received in October from the market, Toronto, Ont., showed lesions varying from sunken areas around the lenticels to almost complete soft decay of the whole tuber (J. K. Richardson).

disease was less prevalent in district 3 than in previous years and was noticed where the tubers had suffered severe mechanical injury at harvest (H. W. eside). Many samples of potatoes affected by soft rot were received at the ratory, Fredericton N. B. The infection is usually associated with mechanical y at the stem especially where hollow heart has developed and the cavity extends e to the stem-end. Canso seems to have this defect more frequently than other eties (J. L. Howatt).

BLACK LEG (Erwinia phytophthora) was found in 103 (15. 7 %) of the fields ected in B. C. and caused the rejection of 2 fields. Although almost as many s were infected as last year, the number showing 2% or more of black leg was tly reduced. It may be noted that the 1951 season was one of the driest ever rienced in B. C. In the Fraser Valley only 0. 2 inches of rain fell between 1 June 25 August (H. S. MacLeod).

Climatic conditions were ideal for the development of black leg in Alta., icularly in the southern part under irrigation. The disease was recorded in (50%) of the fields inspected and caused 21 to be rejected. Most of these s were located in s. Alta. Experience has shown that it is almost impossible ear up black leg in a stock once it has become infected. If care is taken in ng and handling a seed stock until it is planted, growers have little difficulty eeping the stock free of disease. Treating the seed stock with Spergon after it t for planting is helpful. (J. W. Marritt). Sev. infection was observed in some s in the Edmonton district (G. B. Sanford). In spite of excessive roguing 3 s were rejected for black leg at Norquay, Sask. The disease was seen equently in seed potato fields (A. Charlebois). Black leg was seen in 18% of ields inspected in Man. and one field was rejected (D. J. Petty). Numerous s affected by black leg were seen in 3 fields of Sebago inspected in the London rict, Ont. Other varieties affected were Irish Cobbler and Katahdin (F. J. Hudson). k leg caused sl. damage in a few fields at Leamington, Ont. (C. D. McKeen). -acre field planted with certified Sebago seed in Waterloo Co., showed consi- ble disease (J. K. Richardson). Four fields were rejected for black leg in district occurs most frequently in fields planted with Maritime seed (W. L. S. Kemp). disease was less prevalent than in 1950 in district 3; 5 fields were rejected. curred most frequently in the early varieties Irish Cobbler, Warba, and pewa and was most prevalent in the n. Ont. areas inspected (H. W. Whiteside). disease was found in 22 fields in central and e. Ont. and in 13 in w. Que. I. Peters).

Black leg was noted in 394 (37. 1%) of the fields inspected in Que. and caused rejection of 52 fields. Most of the rejected fields were in Chicoutimi Co. and Lake St. John district or in Temiscouata Co. In some fields of Canso 6-7% of plants were affected by the disease (B. Baribeau). Black leg was generally ributed in N. B., but it appeared to be more prevalent in the northern parts of oria and Madawaska Counties. The acreage rejected in 1951 was 0. 6%, compared 0. 3% in 1950. The growing season was cool and wet (C. H. Godwin), Black leg found in 72 of the 387 fields inspected in N. S. and caused 4 fields to be rejected. disease was most frequently noticed in Sebago. Seed treatment with formaldehyde emesan Bel is no longer practised (R. C. Layton). In 4 fields in Cape Breton Co.

infection was 5-10% (P. M. Grainger). Although black leg was present in about th usual number of fields in P. E. I., it caused the rejection of 131 fields in 1951, compared with 245 in 1950 (H. L. McLaren). Black leg was much more prevalent in Nfld. this year than in 1950. Sev. infections of the disease was seen in 45 fiel in the St. John's area and in 25 plots at Conception Bay. In some fields of Canso, infection was 5-15% (G. C. Morgan).

WILT (Fusarium oxysporum) was found in 53 (8.1%) of the fields inspected in B. C. and no fields were rejected (H. S. MacLeod). Wilt appeared to be less prevalent in Sask. than usual. It caused the rejection of one field, but this field had been frequently cropped to potatoes (A. Charlebois). Wilt was less sev. in Man. in 1951 than in the last two years. Wilt was recorded in 7% of the fields but one, with 20% wilt, was rejected (D. J. Petty). Wilt seemed more prevalent in the London district, Ont., than last year, but the percentage of affected plants wa low (F. J. Hudson). Wilt was observed in district 3 in several fields on the lighte soils and mostly of the Chippewa variety; 6 fields were rejected. Stem-end brown etc., associated with wilt, were almost absent (H. W. Whiteside). Wilt affected 1 fields in central Ont. (E. H. Peters). It was observed in small amounts in Canus Irish Cobbler in e. Ont. (O. W. Lachaine). A single affected specimen was receiv from a grower at Ste. Christine, Bagot Co., Que. (H. N. Racicot). A few cases were observed in N. B., but it appeared to be less prevalent than in previous year (C. H. Godwin). Wilt affected about the same number of fields in P. E. I. as last year, but only 31 fields were rejected in 1951, compared with 124 in 1950 (H. L. McLaren). It seems quite probable that some of the wilt attributed to F. oxyspor may be caused by Verticillium albo-atrum (I. L. C.).

WILT (Fusarium oxysporum and Verticillium albo-atrum) was found in 14 (6.6%) of the fields inspected in Alta. and 2 were rejected for wilt. The affected fields were chiefly in s. Alta. (J. W. Marritt). Infection was mod. in a field at Medicine Hat and in the plots at Lethbridge (M. W. Cormack).

DRY ROT (Fusarium spp.). Dry rot (F. solani) was found affecting 20% of the tubers in a lot of certified Warba in a store in North Saanich, B. C. (W. Jones) F. redolens Wr. was isolated from affected tubers of Canso, which were sent in from Sardis, in October. The rot was quite hard (H. N. W. Toms, W. L. Gordon). Some storage rot developed in most lots of seed potatoes in storage in Alta. following injury from frost in the fall of 1951. Ordinary storage rot following mechanical injury was uncommon (J. W. Marritt). Better harvesting and handling procedures in district 2, Ont., appears to have noticeably reduced the amount of bruising and the subsequent development of dry or soft rot in the stored crop (W. L. S. Kemp). Several growers who had imported P. E. I. seed stock of Irish Cobblers brought in samples to the Harrow Laboratory. Probably less than 1% of the tubers were affected in any one shipment (C. D. McKeen). Storage rot was negligible in district 3 (H. W. Whiteside). A few affected tubers were reported during bin inspection in Que.; infection was usually well under 1%. In one lot of table stock 12% of the tubers were affected (B. Baribeau). Storage rot affected less than 1% of the tubers in 1950-51 in P. E. I. (H. R. McLaren). Dry rot was more prevalent than usual in the 1950 crop and the loss in some bins was fairly heavy. Storage conditions tended to be poor because early field frost caused some breakdown and the fall and winter were mild (C. H. Godwin).

Fertile perethecia of Gibberella cyanogena, the perfect stage of the tuber-rot us, Fusarium sambucinum f. 6 have never been found in nature in Canada, ough they develop readily in artificial culture when the two required mating types brought together. Studies on a limited number of mass cultures of F. sambucinum , each from a different source, has revealed that each culture consisted of a le mating type. For instance, mating type a was found in mass cultures that inated in B. C., Sask., and N. B. and mating types A and a occurred separately ass cultures from Man. and P. E. I. Failure to find perthecia in nature is ibuted in part at least to the separation of the two mating types that are essential perithecial production (W. L. Gordon).

SKIN SPOT (Oospora pustulans). Two tubers of Irish Cobbler severely affected e brought to the Laboratory, Charlottetown, P. E. I. (R. R. Hurst).

RHIZOCTONIA (Pellicularia filamentosa (Rhizoctonia solani). Infection was -sl. 122-mod. 22-sev. /656 fields inspected in B. C. and was about as prevalent ast year. Tubers showed sclerotia in fields where the crop was left undug for e time after they were mature (H. S. MacLeod). A mod.-sev. infection was n in 64 (30%) of the fields inspected in Alta. with sl. infection in most other ds. Due to late maturity of the crop, few sclerotia developed on the tubers V. Marritt). Rhizoctonia was particularly severe in fields on heavy soil in Sask. 951, with the heaviest loss in the early planted fields (A. Charlebois). A specimen sent from a severely infected garden at Prince Albert on 7 Aug. The fungus was ting at the base of the stems (T. C. Vanterpool) Rhizoctonia caused no reciable loss in Man (D. J. Petty) Light infections only were observed in the don district, Ont., except on Irish Cobbler on black loam (F. J. Hudson). In rict 2, the disease causes considerable damage where a suitable crop rotation is practised or where the tubers are left for some time in the ground after the death ne vines (W. L. S. Kemp). In one field of Irish Cobbler on poor land in Wellington , the primary stems were girdled and killed and as a result the plants were late K. Richardson). Rhizoctonia was less prevalent than usual in district 3. As al the disease was more active in the Cochrane area than farther south. The wers planted early in 1951 and there was no delay in harvesting the crop. The rs were unusually free of sclerotia (H. W. Whiteside). Rhizoctonia was observed 4/87 fields examined in central and e. Ont., only sl. sclerotial development seen on the tubers. A few growers treat their seed with Semesan Bel and some formaldehyde (E. H. Peters). Rhizoctonia was noted in 98 (9.4%) of the fields pected in Que., infection being sl. in all. Tubers were sl.-mod. infected in elle and Chicoutimi Counties (B. Baribeau). The disease was fairly general in fields throughout N. B., but infection was rarely more than sl. Sl. sclerotial elopment was noted in a few tuber lots (C. H. Godwin) Rhizoctonia was not noticed ny extent in the field in N. S. this year. However, in the Scotts Bay area in gs Co., scurf was so severe on the tubers from 3 fields that it was impossible to de the crop. These fields have been planted almost continuously to potatoes for eral years (R. C. Layton). Only negligible amounts of rhizoctonia developed in C. I. in 1951 (H. L. McLaren). Rhizoctonia was found to have severely infected ut 25% of the sprouts in a field of Green Mountain in Prince Co. on 20 June ulting in most cases in the decay of seed piece. Six other cases were seen in ens Co. (R. R. Hurst). A light infection was observed in 12 fields in Nfld. C. Morgan).

LATE BLIGHT (Phytophthora infestans) was reported in only one seed field in B.C. in 1951. This field at Westham Island had been irrigated by sprinkler. The dry growing season was unfavourable for its development and spread. After field inspections were completed some rain fell and a little blight made its appearance. During a bacterial ring rot survey of some fields after digging, a few affected tubers were noticed (H.S. MacLeod, I.C. MacSwan). No late blight was found in Alta. in 1951 (J.W. Marritt). A sl. infection was seen in several fields in the Norquay district, Sask., in late August, but it is believed low temperatures prevented the disease from spreading (A. Charlebois). Traces of late blight were found in late August or early September at several points in Man. The disease spread little in the next 2-3 weeks in spite of moist cool weather, but localized severe outbreaks finally appeared in the Portage la Prairie and Winnipeg areas. Canso in the former area was free of late blight, while fields of other varieties alongside were severely infected. In most seed potato fields the tops were destroyed by roto-beater and the tubers dug 10-14 days later. Little tuber rot developed (J.E. Machacek, D.J. Petty).

Late blight was first observed in s.w. Ont. (Halton Co.) on 6 July, in central Ont. (Prince Edward Co.) on 9 July and in e. Ont. (Carleton Co.) on 10 July, indicating its almost simultaneous appearance across Ont. The disease continued to spread through much of July, August and in the northern part of district 3 in September. The seed crop was adequately protected over much of the area and the blight warning service was helpful in reaching growers in time, but in much of the crop blight appeared early and became established in sprayed fields. In e. Ont., where late blight became epidemic by mid-August it was estimated that about 10% of the acreage was sl. affected, 25% mod. affected, and 65% sev. affected. The reduction in yield, from the premature death of the vines, varied from 0 to 25% and averaged 5%. An additional 5% was lost from decay of the tubers. No blight was noticed in Canso, or Keswick (C.B. Kelly et al.)

Late blight appeared about 10 July in s.w. Que., especially in Chateauguay, Laval, Terrebonne, and Berthier Counties. In the next 2-3 weeks it was reported from very few additional districts, but by 18 Aug. it had reached almost all potato growing areas in the province, weather conditions being very favourable for its development. In late August it appeared that the epidemic might be as severe as in 1930, when it was estimated that 9 million bushels of potatoes were destroyed by late blight, but the losses were fortunately not that great in 1951. The disease was particularly severe in w. Que. and in the Gaspé Peninsula; the fields were killed prematurely and 5-10% of the tubers were decayed in unsprayed fields.

Late blight was reported in 394 (38.1%) of the fields inspected and it caused the rejection of 10 fields in 1951 compared with 4 in 1950 and 134 in 1930. The roto-beater and herbicides, especially a mixture of sodium arsenite and crank-case oil were used on hundreds of acres to destroy the vines. Growers who killed the vines before mid-September harvested crops virtually free of tuber rot. Those who delayed lost some of their crop. Canso, Keswick, and Kennebec was everywhere highly resistant to late blight, except in a few fields where a trace of the disease was seen on the foliage. At digging time in all fields of Canso, a few tubers were found affected by late blight. In one crop of Keswick in Bonaventure

5% of the tubers were diseased, no other cases were noted. No tuber rot was served in Kennebec. Bin inspection of 496 lots revealed less than 1% tuber fection. In table stocks, tuber infection was about 6% about Montreal and Quebec d in the Eastern Townships. In other districts losses from tuber rot were gligible (B. Baribeau, H. Genereux).

At the Substation, Ste. Clothilde de Chateauguay, in the variety trials, the ants were dusted twice with DDT and sprayed 9 times with a fixed copper. anso yielded 553 bu. and Green Mountain 486 bu. per acre in the trials, in which difference in yield of 39 bu. per acre was significant. In the potato seedling ials, which were dusted only with DDT, no late blight was observed on the liage of Canso, whereas no harvestable crop was produced by Green Mountain account of the disease. From 100 bags of Canso run over the grader, 6 tubers fected by late blight were found. The presence of the fungus was confirmed isolations made at Ottawa. It was estimated that 10% of the crop, which nsisted entirely of susceptible varieties, was a total loss in the Ste. Clothilde ea and the total loss from late blight easily averaged 20-30% of the crop . M. Parks, F. S. Browne).

No fungicide spray program was effective this year in controlling late blight N. B. Weather conditions were ideal for the development of the disease and the idemic got under way about the middle of July and by the first week of September l potato fields were defoliated except those planted to Keswick and Canso, which, th two exceptions showed no infection even when unsprayed. Loss from the sease was due largely to a reduction in yield. This reduction was especially avy in some fields of early varieties which had been poorly sprayed. Loss from t was also heavy in early varieties because they were often dug before the tops ere destroyed. A few bins of Bliss Triumph in the Florenceville area suffered vere breakdown from blight. The late crop, dug 3-5 weeks after the tops were ad, showed little tuber rot (C. H. Godwin, J. L. Howatt).

Late blight was first reported 10 July in Kings Co. and on the South Shore N. S., where some fields were almost defoliated by that date. The disease read rapidly and by mid-August most fields were completely defoliated except ell-sprayed fields. Many growers began to spray after the fields were already tacked; most continued to spray and harvested a crop relatively free of tuber rot. areas where no spraying was done the loss from tuber rot was very high especially the coastal areas of Digby, Yarmouth and Lunenburg Counties. Late blight was en on the foliage in one field of Keswick and two of Canso and after the crop was g tuber rot was found in several lots, one of which showed at least 10% loss. veral other blight resistant seedlings were tested this year in N. S. Some of ese seedlings became infected and later showed tuber rot in some of the plantings. lthough about the normal amount of rain fell some nights were cool and the days umid, dark, and foggy (R. C. Layton, K. A. Harrison). The fungus was isolated om tubers of Canso grown at Starr's Point (K. M. Graham).

The first observed infection of late blight in P. E. I. in 1951 was on potato ants growing in a cull pile at O'Leary in Prince Co. on 16 July; 4 days later a . infection was seen in 2 fields of Sebago in the same area. By the end of July

late blight was present in many localities and by mid-August it had become epidemic. Initial infections usually appeared as small scattered spots on the upper leaves of the plants. Such was the pattern in many fields that were at considerable distance from other fields or were isolated by natural barriers. These observations suggest that viable sporangia were being transported some distance from where they were formed. Fan-shaped infected areas with the apex of each fan opposite an opening in a spruce hedge were observed in several fields

The critical period for an epidemic in P. E. I. usually occurs in September. This year it occurred between 11 August and 1 September. During this period the mean weakly temperatures were 65. 8°F. , 65. 7°F. and 65. 9°F. and the mean for the relative humidity were 84. 3, 81. 5 and 80. 5, the highest recorded for the season. In the 13-week period, 1 July-29 Sept. , 15. 61 inches of rain fell on 41 days and in the 3-week period, 11 Aug. -1 Sept. , 5. 19 inches fell on 12 days. Farmers who failed to reduce the interval between spray applications, as advised were unable to halt defoliation. It was estimated that the yield was reduced as a direct result of defoliation by nearly 1, 000, 000 bushels in P. E. I.

In spite of the extreme severity of the late blight epidemic, losses from tuber rot were less than usual. However, experience has shown that severe tube rot usually follows moderate, but prolonged attacks on the foliage and that losses are negligible in seasons when severe epidemics destroy the vines early and quickly. Considerable rot developed in some lots of table potatoes for the early market that were lifted when the vines were still partially green or otherwise car in contact with viable sporangia. Almost all the rot in the main crop was caused by spores washed down into the hills by rain, but in fields where heavy hilling wa practised few tubers were affected. A survey of Queens Co. and the eastern part of Prince Co. in the last week of August revealed that of the farmers visited 13. 3 had used no fungicide, 66. 6% had used Bordeaux mixture, 10. 0% Dithane or othe carbamates and 10. 0% a neutral copper such as Basi-Cop, C. O. C. S. or Perenox The fungicides were applied by sprayers on 76. 6% of the farms, and 10. 0% by dusters. Besides the 13. 3% of the farmers who applied no fungicide, 63. 3% mad only 1-5 applications and 23. 4% made 6-8. Experiments at Charlottetown demon trated that at least 6 applications of a suitable fungicide were required this year t control late blight.

The loss from tuber rot on most farms was a reflection of the spray progra Farmers who did not use fungicides harvested small crops with little rot, the pla being killed by the disease early and very quickly. Other farmers who sprayed consistently and thoroughly obtained high yields and the loss from rot was very low, adequate spraying having held the disease in check and deposited a toxic laye of copper on the soil. Further protection was obtained by destroying the plants with a herbicide. In general, those farmers who sprayed in a haphazard fashion prolonged the period that the fungus was active on the vines and in consequence lo from tuber rot were heavy. The main crop was harvested under ideal weather conditions. Tubers infected during the growing season were largely culled out by the pickers and no fresh inoculation of the healthy tubers occurred while they wer being lifted. The seed inspectors reported that they cannot recall a year in which so little late blight rot was found in storage (L. C. Callbeck).

Table 8. Effect of the Control of Late Blight on the Yield of Potatoes.

ear	Bordeaux-treated			Untreated			Increase in Yield	
	Total Yield	Tuber Rot %	Mktble. Yield	Total Yield	Tuber Rot %	Mktble. Yield	Total %	Mktble. %
945	286.3	0.2	275.2	249.1	6.4	224.5	14.9	22.6
946	296.5	0.6	285.0	268.7	16.0	218.9	10.3	30.2
947	301.3	1.0	271.5	278.2	15.1	208.6	8.3	30.2
948	275.4	0.4	255.0	199.5	6.6	160.6	38.0	58.8
949	441.4	0.3	398.0	394.6	20.4	277.5	11.9	43.4
950	418.3	1.3	362.9	348.1	18.1	233.1	20.2	55.6
951	333.5	1.1	274.1	257.8	9.6	196.4	29.4	39.6
verage		0.7			13.1		19.0	40.1

ote: The plots in 1949-51 were located in a somewhat more fertile piece of land than formerly; growing conditions were also very good in the last three years. In the years 1945-48, tubers grading No. 2 and No. 3 were included in the Marketable Yield; in the last three years Marketable Yield was based entirely on tubers grading No. 1. Yields in bu. per acre.

It is believed that losses from late blight in Nfld. in 1951 were the highest the last 10 years, especially in the early potato crop, chiefly Irish Cobbler and arba. Not one field visited was free from damage, infection was 10-75%, and eraged 25% (G. C. Morgan). No late blight was seen at St. Anthony, where the evailing temperature is too low for the development of the pathogen (D. B. O. vile).

It is not customary to report in the P. D. S. results of experiments, but some ta kindly supplied by Mr. Callbeck on increased yields obtained when Bordeaux -5-100 was used to control late blight in the plots at Charlottetown, P. E. I. is valuable for the light it throws on losses caused by this disease that it is iefly summarized in Table 8.

Under the conditions at Charlottetown, where late blight becomes epidemic most every year, it will be seen that the average loss from tuber rot is reduced om 13.1% in the unsprayed crop to 0.7% in the protected crop. This saving alone considerable. When the yields are compared it will be seen that both the total eld and the marketable yield of the unsprayed crop are inferior to those of the op sprayed with Bordeaux. In round numbers the total yield is increased 20% d the marketable yield by 40%. Since the benefit from spraying has been nsistently high it would seem a 40% increase in yield may be taken as an average gure.

Table 9. Reaction of Potato and Tomato Varieties to Strains of Phytophthora infestans

Strain	Green Mountain	Canso	Keswick	Stokesdale
Canso, Starr's Point, N.S.	S	S	S	T
Sebago, Bowesville, Ont.	S	I	I	T
Tomato, Picton, Ont.	S	I	R	S

Note: S = Susceptible. T = Tolerant; spreading lesions without sporulations
R = Resistant; pin-point lesions. I = Immune; leaves unmarked.

From the evidence available, the increase in yield of Bordeaux-treated plo is due entirely to the protection provided against late blight. However some fungicides do stimulate the plant. When 10 applications of Dithane D-14 plus zinc sulphate were applied at Charlottetown in 1951 instead of 6 applications of Bordea the yield was significantly increased. Total yields were: Untreated 257.8, Bordeaux 333.5 and Dithane 394.3 bu. per acre. Marketable yields were: Untreated 196.4, Bordeaux 274.1 and Dithane 343.7 bu. per acre. Marketable yield was increased by: Bordeaux 39.6% and Dithane 75.0% (I. L. Conners).

Experiments recently completed in the greenhouse at Ottawa have provided conclusive evidence that physiologic races of the late blight fungus occur in Canada. The results are shown in Table 9 (K. M. Graham).

LEAK (Pythium ultimum). A sl. infection was seen in early harvested tube and also in storage in potatoes from Courtenay, Duncan, and N. Saanich, B.C, (W. Jones). Leak was found in one field of Katahdin on low land in Que.; 5-10% tubers were infected (B. Baribeau).

STEM ROT (Sclerotinia sclerotiorum). A sl. infection was seen on the Bradford marsh, Ont., under moist conditions. The foliage was extremely dens and the stalks in contact with the soil were affected by a soft rot with profuse mycelial growth and abundant sclerotia of the organism (J. K. Richardson).

SILVER SCURF (Spondylocladium atrovirens). Quite a few affected tubers were found in October when the crop harvested from the potato scab research plo from Ancaster, Ont., were examined. The presence of the organism could not be correlated with any particular plot treatment (J. K. Richardson). Very little scurf was seen during bin inspection in district 3. It was found, however, on tubers in the various exhibits at the Royal Agricultural Winter Fair. It seemed most prevalent on Irish Cobbler, Warba, Chippewa and Katahdin. The disease appeared to be most prevalent where the tubers had been rubbed or thoroughly

rushed. The same impression has been gained from examining potatoes in jute ags that have been handled frequently (H. W. Whiteside). A sl. infection was een in a few lots of Green Mountain in Que. at bin inspection (B. Baribeau). About 5% of the tubers of Irish Cobbler were infected in one lot on 24 Feb. 1951 in ueens Co., P. E. I. (R. R. Hurst).

POWDERY SCAB (Spongospora subterranea) was heavy on a tuber received August from a garden plot at Prince George, B. C. (N. S. Wright, H. N. Racicot). number of potatoes were found infected at Clute, Ont., and specimens were ubmitted to Ottawa (H. N. Racicot). The disease was reported in most potato lots rown in the Lower St. Lawrence district, Que.; infection was 1-25%. High soil oisture prevailed during the growing season (B. Baribeau). Powdery scab was eported in 3 lots grown in the Scotts Bay and North Mountain area of Kings Co., .S.; av. infection was 6%. A 50% infection was seen in one lot of table stock in igby Co. (R. C. Layton).

COMMON SCAB (Streptomyces scabies) was less severe and widespread this ear in B. C. than usual. The steady decrease in incidence since 1948 has ontinued. No crops were rejected for scab, but there will be some in scattered reas (H. S. MacLeod). Certified seed stocks were very free of scab this year ven on smooth-skinned varieties. Less scab was found on bin inspection in 1951 an in the last 10 years. (J. W. Marritt). A severe infection was found at dmonton in a garden plot that had been limed in the spring (T. R. Davidson). specimen heavily infected was received from Langenburg, Sask. (T. C. Vanterpool). ommon scab gave no particular trouble in Man. this year (D. J. Petty). Although nly small amounts of sev. scab were observed at bin inspection in the London istrict, Ont., in 1951, sl. scab was found in most crops and even mod. infections ppeared to be more prevalent than in 1950 (F. J. Hudson). One grower on whose arm scab is a problem has produced market-clean potatoes for the past 2 years y growing the variety Ontario (J. K. Richardson). Several crops in Dufferin and ellington Counties were so heavily scabbed that they could not be graded. Severe cab was slightly less prevalent in Durham Co. than last year. Table stock rowers who tested varieties such as Ontario and Yampa, reported clean crops f tubers of good shape and cooking quality (W. L. S. Kemp). Scab was less revalent in district 3 in 1951 than in 1950, probably because of the cool moist onditions (H. W. Whiteside). Scab was comparatively light in central and e. Ont. E. H. Peters). A sev. infection was noted in only 4 lots in Que. (B. Baribeau). l.-mod. infections were seen in a few scattered lots in N. B. (C. H. Godwin). cab was severe in a few lots in N. S. where the potatoes had been planted on old rchard land. The lesions were a sort of russetting rather than the well defined its, usually seen (R. C. Layton). Scab was mod.-sev. in some lots examined n Cape Breton and Inverness Counties (P. M. Grainger). Scab infection was very ght in P. E. I., causing about 2% loss (H. L. McLaren). Common scab was revalent in Conception Bay and the Burin Peninsula, Nfld. Ordinarily, Nfld. soils re considered acid, but since many tons of lime have been available to farmers t reduced rates during the last 10 years soils on quite a few farms are now lkaline. On one large farm near St. John's, the entire crop of Keswick, Canso nd President were heavily infected (G. C. Morgan).

WART (Synchytrium endobioticum). Losses from wart were not great in Nfld. in 1951, but the percentage of infection was high. Wart was definitely found to occur in Trinity Bay, when a 10-50% infection was observed in 12 fields. The disease is also suspected to occur on a farm in St. John's West, a district previously believed free of wart. The disease was again prevalent in Conception Bay, but infection was much lighter than in 1950. Sebago (mauve blossom) is the only variety being grown in Nfld. at the present time that appears to be highly resistant to wart. Keswick that was classed as immune in 1950, and Canso and Katahdin as highly resistant proved to be only moderately resistant this year (G. C. Morgan).

WILT (Verticillium albo-atrum) affected 15% of the plants in a garden plot at Ladner, B. C. ; the fungus was isolated (N. S. Wright). The disease affected about 25% of the plants in plantings of Warba and Netted Gem, from which the pathogen was isolated, at Osoyoos and Summerland. A few affected Warba plants were seen at a field frequently cropped to tomatoes at Kamloops (G. E. Woolliams). Wilt was found in one field in central Ont. (E. H. Peters). A few wilted plants were found in Teton, Sebago, Chippewa, Canso, Irish Cobbler and Green Mountain in Que. ; Sebago was the most severely affected (B. Baribeau). Wilt was reported in 38 out of 387 fields inspected in N. S. (R. C. Layton). The average infection was 1% or less in the principal varieties grown in P. E. I. (R. R. Hurst).

FOLIAR NECROSIS (Solanum virus 1. D strain). Two plants were found in a commercial field in York Co. , N. B. (D. J. MacLeod).

LEAF ROLL (virus) was found in 68 (10. 4%) of the fields inspected in B. C. and caused the rejection of 6, a big reduction over 1950. This drop is attributed to the rejection of crop from several fields in 1950, in which leaf roll had been steadily increasing (H. S. MacLeod). Leaf roll was found in 60 (20%) of the fields inspected in Alta. and 3 were rejected. The disease was more prevalent than usual in the irrigated districts of s. Alta. , but no leaf roll was found in the Peers and the n. e. districts of the province (J. W. Marritt). Many garden plots at Edmonton were severely infected (T. R. Davidson). Certified seed of Netted Gem and Bliss Triumph were planted in a garden in Saskatoon in 1950. The crop became infected from a nearby garden but yielded well. The varieties were planted again in 1951, but every plant was severely dwarfed and the crop was virtually a failure (T. C. Vanterpool). Leaf roll only affected 16% of the fields in Man. in 1951, but it caused the rejection of 4 (D. J. Petty). Leaf roll appeared to be less prevalent in London district, Ont. , than usual, but 2 fields, both Warba, were rejected (F. J. Hudson). With less Sebago and Chippewa being grown in district 2, no fields were rejected (W. L. S. Kemp). In all 8 fields were rejected for leaf roll in district 3. It appears to be most prevalent in Warba. A demonstration plot of Chippewa in the Cochrane area showed no leaf roll in any of the 12 sources of seed planted (H. W. Whiteside). Leaf roll was found in about a third of the fields inspected in central and e. Ont. , and caused the rejection of 2 (E. H. Peters, O. W. Lachaine). Leaf roll was noted in 394 (38%) of the fields inspected in Que. only 6 fields were rejected (B. Baribeau). Leaf roll was less prevalent than last year in N. B. and caused the rejection of only 27 fields (C. H. Godwin). Leaf roll

was reported in 97/387 fields inspected in N.S., with 2 rejections (R.C. Layton). Leaf roll, less prevalent than in 1950, caused only 36 fields to be rejected in P.E.I. (H.L. McLaren). Infection was sl. in 5 fields of Sebago and mod. in 10 fields of Arran Comrade and Kerr's Pink in Nfld. (G.C. Morgan).

LEAF STREAK (Solanum virus 1, N strain). A trace was found in one plant of Katahdin, 2 of Canso and one seedling in a test plot at Fredericton, N.B. (D.J. MacLeod).

SIMPLE MOSAIC (Solanum virus 1, L and S strains) was common in fields in Albert, Carleton, Charlotte, Queens, Sunbury, and Victoria Counties, N.B.; infection was tr. -27%. It was observed in Katahdin, Chippewa, Canso, Keswick, Pontiac, Sebago, Kennebec and 17 seedlings (D.J. MacLeod).

MILD MOSAIC (Solanum viruses 1 and 2). A trace to 3% infection was recorded in table stock fields of Green Mountain in Carleton, Charlotte, Victoria, Westmorland, and Albert Counties, N.B. (D.J. MacLeod).

FAINT MOSAIC (Solanum virus 3). A faint mosaic was found in Arran Victory, President, Keswick, Golden Wonder and 4 seedlings including U.S.D.A. seedling 41956 in a test plot at Fredericton, N.B.; infection was tr. -8% (D.J. MacLeod).

RUGOSE MOSAIC (Solanum viruses 1 and 2) was found in 7 table stock fields in Albert, Carleton, Sunbury, and Victoria Counties, N.B., infection was tr. -3% (D.J. MacLeod).

CRINKLE MOSAIC (Solanum viruses 1, 2, and 3) was common in table stock fields in Carleton, Charlotte, Sunbury, and Victoria Counties, N.B., infection was tr. -5% (D.J. MacLeod).

MILD MOSAIC (Solanum virus 11). A trace to 7% was found in table stock fields of Irish Cobbler in Carleton, York, and Charlotte Counties, N.B. See also next item (D.J. MacLeod).

LEAF-ROLLING MOSAIC (Solanum virus 11) was found in 7 table stock fields of Green Mountain in York and Carleton Counties, N.B. The virus was identified as Solanum virus 11. It resembles Solanum viruses 2 and 3 in its reaction on Nicotiana tabacum, but it differs from them in its ability to infect Datura tatula and D. stramonium. The latter hosts are immune to the type strains of Solanum viruses 2 and 3. Solanum virus 11 is readily transmitted by Myzus persicae, but it is difficult to transmit by sap inoculation. A severe crinkle mosaic is produced when this virus occurs with Solanum virus 2 or 3 in Green Mountain (D.J. MacLeod).

MOSAIC (virus) was found in only 38 (5.8%) of the fields inspected in B.C., about a third as many as last year. It is possible that the symptoms were masked during the prolonged dry season (D.J. MacLeod). Low percentages of a mild mosaic was seen in 15 (7.1%) of the fields inspected in Alta. (J.W. Marritt).

In spite of efforts to eliminate mosaic in Bliss Triumph by tuber-unit planting, the disease has increased in the Pike Lake area, Sask., and 2 fields were rejecte It has also increased in Pontiac at Estevan (A. Charlebois). Mosaic was found in only 9% of the fields inspected in Man. (D. J. Petty). Light infections were noted in Irish Cobbler and Katahdin in the London district, Ont. (F. J. Hudson). Mosaic was fairly heavy in only one field, which was rejected for black leg, in district 2. The large acreage of Katahdin may account for its low incidence (W. L. S. Kemp). Mosaic caused 8 fields to be rejected in district 3. There is some evidence that the mild mottling encountered particularly in Katahdin but also in Green Mountain in this district is due to mineral deficiency. For instance one field in several planted with seed from the same source showed a high percentage of mottling while the other fields showed almost none. Dr. K. Fernow, Cornell University, reported that several lots of Katahdin seed from the Lafontaine distri in Simcoe Co. had a lower incidence of mosaic than lots from many other sources of this variety. One lot of Green Mountain that appeared marginal in previous years in n. Ont. was almost free of mottle in 1951 and produced a crop of over 700 bu. per acre (H. W. Whiteside). Five fields were rejected for mosaic in e. O and small amounts were seen in nearly half the fields inspected (O. W. Lachaine, E. H. Peters). Mosaic was present in 511 (49.3%) of the fields inspected in Que.; compared with 149 (10.8%) last year (B. Baribeau). Mosaic caused the rejection of 27 fields, chiefly of Green Mountain, in N. B., about a third of all rejections (C. H. Godwin). Mosaic was reported in 132 out of the 387 fields inspected in N. S. and caused the rejection of 11 (R. C. Layton). The disease caused the reject of 200 fields in P. E. I. in 1951, compared with 456 in 1950; it was less prevalent, except in Green Mountain, than last year (H. L. McLaren). The average amount of mosaic in table stock fields based on counts of 10 fields of each variety were: Green Mountain 1%, Irish Cobbler, Sebago and Katahdin trace (R. R. Hurst). Mild mosaic was seen in every field visited in Nfld. and infection was often high. Traces of rugose mosaic were seen in a few fields of Green Mountain and Arran Pilot, whereas about three quarters of the fields of Arran Victory and President showed high infections (G. C. Morgan).

PURPLE or BUNCH TOP (virus). Nine units affected by haywire occurred in a plot of 2452 units grown to check the transmission of witches' broom in the Cariboo district, B. C. Whether this disease is distinct from the haywire stage of purple top is unknown. No purple top was seen in the Cariboo in 1950 (N. S. Wrigh Purple top was found chiefly in Alta. in the Peers and the Peace River districts. Haywire was found in 18 (8.5%) of the fields inspected and purple top in 39 (18.4% (J. W. Marritt). Five fields in Man. showed 1-3% of the plants affected by bunch top, with tr.-0.5% in some other fields (D. J. Petty). A single plant was found affected by purple top in a field of Katahdin in the London district, Ont. (F. J. Hud Purple top was doubtfully present affecting scattered plants in Durham Co. (W. L. S. Kemp). This disease was negligible in district 3 (H. W. Whiteside). Traces of bunch top were observed in 9 fields in central Ont. and 7 in the Ottawa district (E. H. Peters). Canso plants showing typical symptoms were brought in by E. H. Peters from a field at Port Perry (H. N. Racicot). A sl. infection was observed in fields of Canso in Que. On the other hand a large number of affected plants were noted in table stock fields of President (B. Baribeau). Purple top was again fairly common in fields of Katahdin in N. B., but less prevalent than in previous years (C. H. Godwin).

Bunch Top was widespread in potato fields in Carleton, Queens, Sunbury l York Counties. Current season infection was a tr. to 12% in 12 fields examined. e bunch top symptoms were found in Bliss Triumph, Canso, Chippewa, Green untain, Irish Cobbler, Katahdin, Keswick, Pontiac and Sebago.

Late Leafroll (cf. P.D.S. 27:69. 1948), the early stage of bunch top, was nmon in Carleton, Sunbury, Charlotte and Victoria Counties. It was found the varieties mentioned above except Canso and Keswick. Haywire, or the condary stage of bunch top, was noted in Canso, Green Mountain, Irish Cobbler, tahdin, Keswick, and Sebago. Misses attributed to bunch top infection of the ed pieces were noted in 2 fields: 7% in Sebago and 1% in Katahdin (D. J. MacLeod). rple top affected 10-15% of the plants in a field of Sebago and traces were noted a few other fields in N.S. (R.C. Layton). The disease was of little importance P.E.I. (H.L. McLaren). Average infection in table stock fields was estimated be: Sebago 1%, Irish Cobbler, Green Mountain, and Katahdin trace (R.R. Hurst). aces were seen in fields of Menominee, Arran Pilot, and Arran Victory in Nlfd. C. Morgan).

SPINDLE TUBER (virus). Traces were observed in Man. and Ont. (D. J. tty et al.). Small amounts were observed in several varieties, mostly table ck, in Que. (B. Baribeau). A trace was reported in a few fields of Irish Cobbler N.B. (C.H. Godwin). A trace to 3% of spindle tuber was found in 8 fields amined in Carleton Co., infecting Kennebec, Green Mountain, Irish Cobbler, and tahdin (D. J. MacLeod). Spindle tuber caused 31 fields to be rejected in P.E.I. 1951, compared with 5% in 1950; it was found mostly in Sebago (H.R. McLaren). aces were found in 5 fields of Irish Cobbler and high percentages in 20 fields Arran Victory in Nfld. (G.C. Morgan).

WITCHES' BROOM (virus) was found in 79 (12%) of the fields inspected in C. and 13 fields were rejected. Although fewer fields were infected, a larger nber of fields were rejected. The disease is most prevalent in the Cariboo trict (H.S. MacLeod). To determine the amount of transmission of witches' oom in the Cariboo in 1950, 2452 tubers were selected from the same number symptomless plants of White Rose grown at Soda Creek and planted at Richmond, ere transmission of the disease has never been observed. Out of the 2452 units own 11 units were found infected with witches' broom (N.S. Wright). Witches' oom was found affecting 36 fields located in the Peers (n.e. Alta.) and the Prince ver districts. Both witches' broom and haywire occur in the same fields and s not always easy in the early stages to distinguish between plants affected by se two diseases (J.W. Marritt). A few infected fields were seen in the most rtherly part of district 3, Ont. (H.W. Whiteside).

YELLOW DWARF (virus). Single affected plants were collected in Keswick Port Parry, and in Canso at Pontypool, Ont., and in Green Mountain near nnonciation, Labelle Co., Que. (E.H. Peters, O.W. Lachaine).

CRACKING (non-parasitic) affected most of the tubers in a planting of Essex Queens Co., P.E.I. (cf. W.L.G.G. Cracking of Potato tubers. Abstr. R.A.M. 377. 1941) (R.R. Hurst).

FROST INJURY. Net necrosis, due to frost killing the plants, caused some damage in n. central B. C. (H. S. MacLeod). Early frosts caused some damage to tubers near the surface in district 2, Ont. (W. L. S. Kemp). An unusual internal browning occurred in some lots of Chippewa and Canso grown in the Cochrane district. The injury was believed to be caused by a severe frost before harvest (H. W. Whiteside). Small amounts were seen in the Ottawa district (E. H. Peters). Frost injury caused slight damage to a few lots in Que. (B. Baribeau). Several fields of Arran Victory and Arran Banner were slightly injured by frost in St. John's Nfld. (G. C. Morgan). Two cases of rather severe injury wereseen in 2 lots of Sebago in P. E. I. Also some low temperature injury occurred during the winter 1950-51 (R. R. Hurst).

GIANT HILL was reported in 100 (15. 2%) of the fields inspected in B. C. in 1951; the figures for 1950 were 236 (23. 7%) (H. S. MacLeod). Giant hill was more prevalent than usual in Chicoutimi and Lake St. John districts, Que. (B. Baribeau). A condition resembling giant hill was common in commercial fields of Green Mountain, Irish Cobbler and Bliss Triumph in Carleton and York Counties, N. B. (D. J. MacLeod.)

GROWTH CRACKS. Oversize, hollow tubers or ones with large growth cracks were common in Sask. ; the fall was abnormally wet (H. W. Mead).

INTERNAL BROWN SPOT was unusually prevalent this year in the Lower Mainland, B. C. It was attributed to inadequate soil moisture during tuber development. The trouble was noticed principally in Katahdin and Netted Gem on clay land (I. C. MacSwan). The disorder also occurred on Vancouver Island, where it caused considerable loss in some gardens. Great Scott, Early St. George, Columbia Russet, and Netted Gem were affected (W. Jones).

NO-SPROUT TUBERS. Several poor stands occurred particularly in fields of Canso in the Courtenay district, B. C. It occurred to a lesser degree in White Rose, Green Mountain, Columbia Russet, and Keswick. The trouble was attributed to high temperature during storage and dry soil conditions at and after planting. In a few lots, the seed had sprouted heavily in storage and the sprouts had to be broken off before planting. Instead of forming normal sprouts, the seed pieces developed tubers, resulting in a miss (W. Jones). Misses in the field as high as 30% of the stand were common this year in N. B. , due to the failure of the eyes of sets to develop normal shoots; instead, tubers developed. This condition was most prevalent in Katahdin and Sebago. Work done at Boyce Thompson indicates that the condition is due to too high soil temperatures prior to digging or high storage temperatures (J. L. Howatt).

NET NECROSIS. Not over 0. 25% of the tubers were found affected in either table or seed stock in Que. (B. Baribeau). A few mild cases were observed in Green Mountain in Madawaska Co. , N. B. (C. H. Godwin). Only one case of net necrosis or stem end browning has been reported in N. S. About 2% of tubers were slightly affected in a crop of Green Mountain, the vines of which had been killed by a herbicide (R. C. Layton).

POTASH DEFICIENCY. Some of the fields in the Covehead area, Prince Co., E. I., are deficient in available potash yet show adequate amounts of reserve ash. About 10% of the plants were affected in the field examined (R. R. Hurst).

STEM-END DISCOLORATION. Tubers of the Canso variety often show a order that is mistaken for stem-end browning or black leg. Affected tubers st show a slight swelling and browning in the peripheral cells about the stolon its junction with the tuber. After digging the stolon end does not heal properly l a more or less open, depressed, brownish area develops. Groups of brownish ls may occur anywhere between the pith and the skin. When an extensive group cells become brownish and necrotic, a cavity may develop within them, parti- larly in the central region, to form a more or less extended cavity. If the cavity ends to the surface, soft rot commonly sets in although Fusarium dry rot metimes develops. Other fungi may occasionally become established but are lled off by formation of cork. The condition is not always confined to the larger ers. In one lot 10% of the tubers were affected. No organisms have been lated from deep-seated, isolated, affected centres (J. L. Howatt).

PUMPKIN

POWDERY MILDEW (?Erysiphe cichoracearum) was observed on the leaves one plant of Connecticut Field in the University plots, Vancouver B. C. N. W. Toms).

RADISH

CLUB ROOT (Plasmodiophora brassicae). A very heavy infection was found muck land at St. Leonard - Port Maurice, Que. (E. Lavallee).

SCAB (Streptomyces scabies) was found affecting radishes at Ancaster, Ont., ng quite severe in areas where infection was heavy on potatoes (J. K. Richardson).

BROWN HEART (boron deficiency). A trace was seen in a garden in Queens ., P. E. I. (R. R. Hurst).

FUME INJURY (?SO_2) caused the plants to be stunted and leaves chlorotic browned in a planting on muck soil near a nickle smelter at Port Colborne, t., in July (J. K. Richardson).

RHUBARB

LEAF SPOT (Phyllosticta straminella). One leaf heavily infected in a nting in Carleton Co., Ont. (D. S. MacLachlan).

MOSAIC (?virus). A plant was affected in a private garden at Jervis Inlet, C. (R. Stace-Smith).

RED LEAF (cause unknown). Canada Red and Macdonald continue to show the greatest resistance to red leaf among the varieties grown at Lacombe, Alta.; however, a few plants of these varieties were infected this year. The disease wa also observed in a planting of Ruby at Edmonton (T. R. Davidson). The disease was seen at Saskatoon, Sask., and affected specimens were received from Milde and Cutknife. The latter infection was on a "green" variety from a garden in the virgin prairie, the root cuttings were supposed to have come from a garden where the disease was unknown. Dr. Dowson, Cambridge University, was of the opinio that red leaf of rhubarb exhibits the same internal crown symptoms as the bacteri disease of rhubarb in England. The 'red leaf' symptom is not found in English varieties (T. C. Vanterpool).

SPINACH

DOWNY MILDEW (Peronospora spinaciae) caused mod. losses on muck lan at St. Michel, Laval Co., Que. (E. Lavallee).

CHLOROSIS and LEAF DROP (manganese deficiency) caused mod. damage to spinach in the Horticulture plots, Ottawa, Ont. (K. M. Graham).

SWEET CORN

SMUT (Ustilago maydis). Infection was reported: sl. at Medicine Hat, and Edmonton, Alta. (A. W. Henry); fairly heavy in a garden plot in York Co., Ont. (H. N. Racicot).

SQUASH

BACTERIAL WILT (Erwinia tracheiphila). One plant of Hubbard squash wa found affected in a garden at Kentville, N. S. (K. A. Harrison).

WILT (Verticillium albo-atrum) affected 10% of the plants of Buttercup in a planting at Vernon, B. C.; the pathogen was isolated (G. E. Woolliams).

TOBACCO

The diseases of tobacco were summarized in a special report by Dr. L. W. Koch.

Seedbed Diseases

BLUE MOULD (Peronospora tabacina) did not occur either in the New or O Tobacco Belts of Ont. until the last week of May, when scattered infections appeared in numerous districts. By this time transplanting was well under way and damage was slight because after the plants became infected the dry weather proved unfavourable for development of the disease.

YELLOW PATCH (excessive nutrients) caused considerable damage throug the New Tobacco Belt. It seems that many growers are still prone to overfertili their tobacco seedbeds even though they are aware of the danger from so doing. Damage from this trouble was negligible in the Old Tobacco Belt.

DAMPING-OFF (Pythium sp. and Rhizoctonia solani) was widespread and used moderate damage during the early part of the season in the New Tobacco lt of Ont. Continued cloudy weather provided favourable conditions for the ease, but it caused damage only where water was applied in excess or in a lty manner. In all beds where severe damage was reported or observed the owers did not follow a spray program for control of blue mould.

Mushrooms continued to cause mild damage throughout the burley and dark bacco areas of Kent County.

2,4-D (Dichlorophenoxyacetic Acid) INJURY. A number of cases of injury s brought to our attention apparently as the result of using improperly-cleaned apsack sprayers.

Field Diseases

BLUE MOULD (Peronospora tabacina). Widespread infection of tobacco in the ld occurred in extensive areas of the New Tobacco Belt of Ont. A study of ese occurrences strongly indicated their origin to be spore showers from the S. tobacco growing areas - probably from Kentucky, Virginia and Ohio. ection in most cases was limited to leaves on the lower half of the plant although some fields all leaves showed spots resulting from blue-mould infection. or a detailed study of its epidemiology see R. H. Stover and L. W. Koch, Sci. r. 31:225-252. 1951).

In general, damage to tobacco in the field by the blue mould fungus in Ont. s perhaps more serious during 1951 than in any previous year.

BROWN ROOT ROT (nematodes) caused mild damage to burley tobacco in sex and Kent Counties and less than the usual amount of damage on flue tobacco roughout Ont.

BROWN ROOT ROT (Thielaviopsis basicola) caused mod. damage to pipe and gar varieties in Que. On the other hand, less damage than usual occurred through- the flue-cured areas of Ont. Growing more of the resistant variety Delcrest s, in part, responsible for the reduced amount of injury in the flue-cured crop Ont.

MOSAIC (virus) was widespread throughout the burley and dark tobacco areas Essex and Kent Counties. Etch strains of the virus again proved to be responsible most of the disease present. (See also R. H. Stover, Tobacco etch virus in tario. Can. Jour. Bot. 20:235-245. 1951).

RINGSPOT (virus) was observed to be scattered throughout the burley tobacco ea of Kent Co. ; damage was slight.

SORE SHIN (?Rhizoctonia solani) occurred in several fields of flue-cured d burley tobacco in Essex County. This condition was observed at a much later e than usual and resulted in the weakening of stalks of plants that were nearly ture. There was some evidence that organisms other than R. solani contributed the damage.

Other Observations

MOSAIC (virus) was particularly troublesome in Que. in 1951, because conditi were wet during the period of cultivation (F. Godbout).

TOMATO

EARLY BLIGHT (Alternaria solani) was not observed in the Lower Fraser Valley, B.C., during this dry summer (H N.W. Toms). Most tomato patches suffered some defoliation in the Saskatoon area, Sask.; yields were probably little affected (H. W. M.) Only traces of the disease were found in the early crop at Leamington, Ont. (C.D. McKeen). Early blight caused extensive defoliation in many plantings of early staked tomatoes in Lincoln Co. In one field where the foliage had been severely blighted earlier, the disease caused severe damage to the fruit (J.K. Richardson). A survey of 50 fields in Prince Edward Northumberland and Hasting Counties the first week of September revealed that early blight was mod. - sev. in some fields causing defoliation and black rot of the fruit. Along with late blight (q.v.) this disease was causing considerable loss in marketable fruits in the area. The concensus of opinion was that protective measures are not feasible because of the excessive cost of fungicides and their application. However, in the absence of any demonstration of sprayed vs. unsprayed crops it is difficult to accept this point of view as final (K.M. Graham). Early blight was general, as usual, in the Montreal district, Que.; it caused light losses (E. Lavallee). Early blight caused more defoliation than usual in Hants Co., N.S., because of wet weather in August and September. A 5% loss was estimated in fruit ripening in storage (K.A. Harrison). The disease was quite prevalent in gardens in Queens Co., P.E.I. (R.R. Hurst). Mod. infections were noted in 4 plantings in the St. John's area, Nfld. (G.C. Morgan).

GREY MOULD (Botrytis cinerea) appeared in 2 fall greenhouse crops at Leamington, Ont.; 50% of the plants showed stem lesions and a few plants were killed (C.D. McKeen). Grey mould killed about 2% of the plants in a spring greenhouse crop at Kingston, N.S., and about 1% in a greenhouse in October at Falmouth. About 3% of the fruits rotted on the vines in the spray plots at Kentville. Most of the affected fruits were in contact with the ground. The disease was very common in field crops this year (K.A. Harrison). Stem cankers were fairly common in a greenhouse crop at Falmouth where the twine had abraded the stems (J.F. Hockey).

LEAF MOULD (Cladosporium fulvum) caused a small amount of damage in commercial greenhouses in the Okanagan valley, B.C. (G.E. Woolliams). A severe general infection occurred on Vetomold in a greenhouse at Medicine Hat, Alta. (M.W. Cormack). In the Leamington area, Ont., leaf mould was not observed where either of the resistant varieties Improved Bay State or Vulcan was grown. However, the disease caused extensive defoliation with resultant losses where susceptible varieties were used (C.D. McKeen). Leaf mould was present on the fall crop in 8 greenhouses near Sherbrooke, Que. Four crops were severely defoliated and growers considered that the losses would be high (E. Lavallee).

ROOT ROT (Colletotrichum atramentarium). Samples of affected roots were eived from a greenhouse near Leamington, Ont., the extent of the damage was learned. The ascervuli of the fungus were observed on the rotted roots and responded to the descriptions given by McKay, who states that it is "one of the ınmonest and most ruinous maladies attacking tomato plants in Ireland" bert McKay. Tomato Diseases Dublin 1949, pp. 19-20) (C. D. McKeen).

ANTHRACNOSE (Colletotrichum phomoides) was much less prevalent than in ne years in the canning crop in s. w. Ont.; it developed toward the end of the son on the early crop. (C. D. McKeen). The disease was present on over-ripe it only in 6 fields examined in the canning area centering on Prince Edward Co. M. Graham). Anthracnose is established in one garden at Kentville, N. S., venting the late ripening of fruit from this garden. Traces were present in the tion garden. The disease is a serious threat to the practice of ripening picked it after the season closes (K. A. Harrison).

BACTERIAL CANKER (Corynebacterium michiganense) affected about 5% of the nts in a planting of Moscow at Lillooet, B. C. (G. E. Woolliams). A sl. infection s seen om 3 fields at Medicine Hat, Alta. (M. W. Cormack). The disease caused siderable damage in a 5-acre field of canning tomatoes at Belle River, Ont. D. McKeen). About 10% of the plants were severely affected in a field at Levis, e.; no previous case had been observed in the district (O. Caron). Bacterial ker caused about 20% damage in two fields at Falmouth, N. S. The transplants re raised in a greenhouse where the disease was present in 1950 (K. A. Harrison).

WILT (Fusarium lycopersici) was less prevalent in commercial fields at Medicine , Alta., than in 1950; about 1% of the plants were severely damaged in the 3 fields mined (M. W. Cormack).

PHOMA ROT (Phoma destructiva) caused increasing losses during the storage iod at the Station, Kentville, N. S. About 10% damage was seen in one lot and average loss was 2% (K. A. Harrison).

LATE BLIGHT (Phytophthora infestans) was not seen in the Lower Fraser ley, B. C., in 1951 (H. N. W. Toms). Late blight was found on tomato fruits Man. almost as early as on potatoes and by late September was very preva- t. Green fruits harvested when warnings of frost were broadcast, were in y instances a total loss before the fruits ripened in storage (J. E. Machacek). ıces of late blight were observed in a few fields of the canning crop in Essex , Ont., late in the season. The disease also developed in a few greenhouse ps, in the Harrow-Leamington area, in which the crop was not protected. st growers have followed the recommendations to spray or dust plants with xed copper at fortnightly intervals, following the widespread and serious ses suffered by many growers in the fall crop of 1950 (C. D. McKeen). Field aying of tomatoes was recommended as a general practice in the Niagra Pen- ula for the first time this year and the results have been excellent. Although ection started early, wherever regular fungicide applications were made losses re significantly reduced and most of the crop could be harvested. Many of the prayed plantings were a total loss (J. K. Richardson). Late blight infection s mod. in 7 and sev. in 12 of the 50 fields surveyed in the canning area centering

on Prince Edward Co. Only one grower applied fungicides to control the disease. As remarked under early blight (q. v.) the loss was considerable in marketable fruits (K. M Graham). Late blight was general in e. Ont. and some 10% of the plantings were severely affected. Foliage and stem infections were general with some disease on the fruit (H. N. Racicot). The outbreak of late blight this year was the most severe experienced for many years in the Montreal district, Que. ; losses were high everywhere (E. Lavallee). Late blight was first observed on tomato fruits on 2 August in Laval Co. By the end of the month the disease was severe in many parts of Que. and losses were as high as 75% of the crop in some fields. The late crop was a total loss in most localities (H. Genereux). Late blight was first observed on tomato on 10 Aug. in Queens Co. , N. B. (S. F. Clarks Late blight was very prevalent in N. B. and caused a loss of half the crop in unsprayed and poorly sprayed fields. Even in sprayed fields there was considerab fruit rot (J. L. Howatt). Late blight was first observed on tomatoes on 10 Aug. in N. S. In the canning area, in 6 fields examined, infection was light with no loss of fruit. Most tomato fields were well sprayed, but for the third year growers who did not spray lost their late crop of tomatoes. Home gardens suffered severe (K. A. Harrison). Late blight was destructive to tomatoes in many locations across P. E. I. (R. R. Hurst). See p. 64 for physiologic specialization of the pathogen.

BACTERIAL SPECK (Pseudomonas tomato). A sl. infection was seen in a planting at Edmonton, Alta. (L. E. Tyner). Most of the fruits in a small field of early tomatoes at Leamington, Ont. , were well spotted; the loss was heavy becaus the fruits were unmarketable (C. D. McKeen).

DAMPING-OFF (? Pythium sp.). Damage was mod. in 3 greenhouses and tr. in 2 in Nfld. (G. C. Morgan).

STEM ROT (Sclerotinia sclerotiorum) affected a single plant in a plot at Kentville, N. S. (K. A. Harrison).

LEAF SPOT (Septoria lycopersici). Leaf and stem spot was mod. -sev. in 10 fields out of the 50 surveyed in the area centering on Prince Edward Co. , Ont. ; the disease was most severe where tomatoes had been grown on the same land for 2 or more years. A sl. infection was also present in the Laboratory plots at Ottawa (K. M. Graham). As in previous years leaf spot caused much defoliation of the early crops in Essex Co. (C D. McKeen). Mod. infected leaves were received from Farnham, Que. (H. N. Racicot). Traces of leaf spot were found in most fields of tomatoes in Kings Co. , N. S. , before the close of the season. Very little of this disease has been seen in previous years (K. A. Harrison). Leaf spot caused sl. defoliation in 3 small acreages of early tomatoes in the St. John's area Nfld. (G. C. Morgan).

WILT (Verticillium albo-atrum) was widespread in B. C. and caused considera damage (W. R. Foster). The survey of crops for Verticillium wilt in the B. C. Interior begun in 1950 was continued. The disease is widely distributed in the Okanagan, Thompson, and Upper Fraser Valleys. It was most prevalent on tomat and pepper (q. v.), 10-100% of the plants being affected. Other hosts were potato,

gplant, cucumber, cantaloupe (cf. melon), watermelon, squash, apricot and me weeds. At Kamloops and Lillooet, the disease was severe affecting about)% of the plants in fields planted continuously to tomatoes. Infection was sl. fields planted to tomatoes for only 2-3years and no infection was noted in fields wly planted to tomatoes (G. E. Woolliams). V. albo-atrum was isolated from e stems of tomato plants showing wilt symtoms that were sent in from a green- use in Lincoln Co., Ont. (J. D. Gilpatrick). Wilt caused a severe loss in edlings 5-6 weeks old in a greenhouse at Trenton, N. S. It affected 20% of e plants of Bay State in a new greenhouse producing its second crop of tomatoes Falmouth; the soil had not been sterilized (J F. Hockey, K. A. Harrison).

DOUBLE VIRUS STREAK (virus). A diseased plant received from Norwood, an., on 13 Aug. showed symtoms typical of this disease -- dark streaks on ems, fruits rough with "grease spots" and necrotic areas in the leaves. When e garden was examined 1 Sept. many diseased plants were seen and a few were heavily attacked that they bore no marketable fruits. A plant of Bonny Best oculated mechanically with the juice of the infected plant developed the disease. nen juice from the inoculated plant was passed through a Seitz filter and used inoculate 5 plants of Bounty, all 5 developed the disease. Five control plants oculated with sterile water remained healthy. One month later all 5 inoculated ants were dead and the 5 controls still healthy (W. A. F Hagborg).

MOSAIC (virus) was severe in a greenhouse on Lulu Island, B. C. 29 April C. MacSwan). Mosaic infected a few plants in some fields to almost 100% in ners on 30-31 July in the Kamloops area. Up to 10% of the plants were affected in me of the plots at Summerland (G. E. Woolliams). Shoe string-mosaic ucumis virus) was found affecting 50% of the plants in a planting of staked matoes in Lincoln Co., Ont., on 1 June; the leaves were severely stunted . C. Chamberlain). Mosaic was found in many fields in the Montreal district, ie. Some 50% of the plants were infected at Ste. Dorothee and Ste. Rose. A ace to 40% of the plants showed mosaic in 8 greenhouses near Sherbrooke . Lavallee). In a greenhouse in York Co., N. B. 3% of the plants showed a faint osaic caused by Solanum virus 1, strain L. In a commercial greenhouse in nbury Co., 3% of the plants were affected by mosaic (Nicotiana virus 1); mage was sl. The fern-leaf effect was seen in 2 plants in a planting in York Co. . J. MacLeod). All the plants in a greenhouse crop of Bay State at Kingston, N. S., re affected. The grower estimated that a serious reduction in yield occurred the first 2-3 trusses (K. A. Harrison). Mosaic was also seen in Inverness and ctoria Counties (P. M. Grainger). About 50% of the plants were affected in a eenhouse at Torbay, Nfld. (G. C. Morgan).

PURPLE TOP (virus). A trace to 1% was noted in 7 plantings in Sunbury and rk Counties, N. B. (D. J. MacLeod).

YELLOWS (Beta virus 1) caused very little damage in the southern part of the anagan Valley, usually only an occasional plant being affected (G. E. Woolliams).

BLOSSOM-END ROT (non-parasitic) was common in gardens especially on okesdale about Sidney and Victoria, B. C., under the dry conditions prevailing 1951 (W. Jones). The disease was general in the Lower Fraser Valley and as

high as 90% of the fruit were affected at times in the University plots, Vancouver (H. N. W. Toms). Blossom-end rot occurred throughout the Interior. It affected some or all the fruits on the first truss, but those formed later were rarely affected (G. E. Woolliams). Blossom-end rot was common in a planting in Carleton Co., Ont., the soil tended to dry off rapidly after rains and it had been heavily fertilized (K. M. Graham). Very little loss of fruit occurred in N. S. (K. A. Harrison) or P. E. I. (R. R. Hurst). Some loss occurred in several greenhouses in Nfld.; losses in field tomatoes were less than in 1950 (G. C. Morgan).

BLOTCHY RIPENING (non-parasitic) was general and caused considerable loss of fruit in one greenhouse at Sooke, B. C. (W. R. Foster). This disease has been observed on tomato fruits for the last 4-5 years in N. B. At first I mistook it for late blight on the fruit. The name "Blotchy Ripening" proposed by Atkinson of New Zealand (cf. P. D. S. 30:92) is a very accurate description of the symtons after the tomato has ripened. However, what appears to be the same disease is called "Grey Wall" by the pathologists in Florida. This term refers to the symtoms in the immature fruit and is quite appropriate since most of tomatoes grown there are still green when they are picked to ship to northern markets. I have seen the disease in Florida and the symtoms on the green fruit are very severe. If a fruit is cut crosswise circular to elongate brown spots are present in the central tissue of the wall. If a thin slice is removed from the side of a fruit brown streaks sometimes almost continuous are exposed. The cause of the trouble is still unknown but some ovservations made by me last winter in Florida agree with Atkinson's contention that the disease may be kept in check by reduced watering. This disease according to Dr. Conover, has only been observed in Florida for the last few years which is my experience in N. B. (S. F. Clarkson). Blotchy ripening was found everywhere in Kings Co., N. S., throughout the season this last summer, and 20% of the fruit were commonly affected. The trouble does not seem to be associated with potash deficiency (K. A. Harrison).

2,4-D INJURY. Considerable distortion of the foliage and lack of seed development in the fruits were observed in Essex Co., Ont., in many tomato fields where nearby roadsides or stands of weeds had been sprayed with the ester form of 2,4-D (C. D. McKeen). Specimens of severely malformed leaves and elongated seedless fruits injured as a result of spraying roadsides and weeds were brought to the laboratory from Lincoln Co. (J. K. Richardson). Crop in a home garden at Scarboro was almost a total loss as a result of spraying a roadside and a railway right-of-way near the garden (H. N. Racicot). Fully half the crop was killed and the rest severely injured in a greenhouse in Trenton, N. S. The owner of the sprayer loaned it to another, who used it to apply 2,4-D and returned it without notifying the grower of the fact (K. A. Harrison).

FRUIT ROT (cause unknown). A few fruits affected by a watery soft rot, dull green in colour, and covered with a growth of Penecillium were found in a field in Carleton Co., Ont.; the fruits were quite small when they became infected (K. M. Graham).

TURNIP

GREY MOULD (Botrytis cinerea). In April about 30% of the stecklings of one of Ditmars swede turnips at Barton, N.S., showed lesions on the sprouts and ks; of these half had to be discarded. When the infected roots were planted the ease progressed further and the yield of seed was reduced 75% (K.A. Harrison).

SOFT ROT (Erwinia carotovora). A few plants of Ditmars Bronze Top swede nip were found infected in a field at Barton, N.S. (K.A. Harrison).

POWDERY MILDEW (Erysiphe polygoni). A light infection was seen on a crop Ditmars Bronze Top at Barton, N.S., in late October (K.A. Harrison).

DOWNY MILDEW (Peronospora brassicae). A heavy infection was seen on mars Bronze Top at Barton, N.S., in June; leaves were somewhat curled and ing out (K.A. Harrison).

BLACK LEG (Phoma lingam). A tr. to 10% of the plants were affected in ntings of Laurentian swede turnips in Queens Co., P.E.I. (R.R. Hurst).

CLUB ROOT (Plasmodiophora brassicae). A field of about 1/3 acre of Ditmars onze Top at Barton, N.S., was severely damaged by club root. It was particularly ere in the lower part that is sometimes flooded (K.A. Harrison). Infection was in a field in Cape Breton Co., and 10% in Inverness Co. (P.M. Grainger). In as in Nfld. where Wilhelmsburger is being grown loss has been greatly reduced. vever, small garden plots in Trinity, Bonavista, and Notre Dame Bays are heavily cted. Subsistence farmers have such small plots that they do not practise crop ation (G.C. Morgan).

STORAGE ROT (Rhizoctonia solani). A waxed swede turnip root showing eral small darkened areas up to 1 cm. in diameter and evidently enlarging was eived from D.R. Sands, Department of Botany, O.A.C., Guelph, Ont. Two axed roots were perfectly healthy. Rhizoctonia solani was almost the only gus isolated from the dark spots (H.N. Racicot). Almost 20% of the stecklings m a lot of Ditmars Bronze Top rotted in storage at Barton, N.S.; the fungus freely isolated (K.A. Harrison).

SCLEROTINIA ROT (S. sclerotiorum). A single plant found affected at ton, N.S. Several flowering stalks rotted during the summer in a seed plot Kentville (K.A. Harrison).

BLACK ROT (Xanthomonas campestris) caused considerable damage in one pment of swede turnip from Pemberton Meadows to Victoria, B.C. (W.R. Foster). roots severely rotted were brought in to the laboratory at Charlottetown, P.E.I. R. Hurst).

MOSAIC (virus). About 15% of the stecklings in a planting of Ditmars onze Top at Barton, N.S., showed mosaic mottling and the affected plants were newhat stunted. (K.A. Harrison).

STERILITY (virus). About 2% of the plants in a seed plot in York Co., N.B. showed sterility (D. J. MacLeod). About 1% of the plants showed the typical steril inflorescence in a field of Ditmars Bronze Top at Barton, N.S. (K. A. Harrison).

WITCHES' BROOM (virus). Two affected plants were found in a seed plot in York Co., N.B. (D. J. MacLeod).

BROWN HEART (boron deficiency). Traces were observed in all three count of P. E. I. In one field at Kensington, 3% of the roots were mod. infected (R. R. H Sl. damage was observed in Trinity Bay and Conception Bay, Nfld. (G. C. Morgan)

2,4-D INJURY. When 2,4-D (ester) was sprayed on a field of grain to control mustard in Queens Co., P. E. I., it caused injury to hoed crops in parallel rows in an adjoining field. Injury was severe on the turnips (1 1/2 acres), greatly stunting the growth. Affected roots remained small, curved, and narrow waisted. Hardly a root reached normal size in the half of the planting nearest the grain field and it was estimated the loss was 80% of the crop; the other half was probably less severely affected, but it was not carefully examined. The carrots (1/2 acre) were also affected but would probably produce a harvestable crop. The crown was roug and woody, but the rest of the root appeared normal. The potatoes (1 acre) had shown some twisting and curling of the vines, but appeared to have outgrown the condition. The mangels (1/2 acre) were unaffected. A second case was seen later. Similar injury by 2,4-D was observed by L. C. Callbeck last year at Woodstock, N.B., and Dr. R. O. Bibbey, O. A. C., Guelph, reported that he had seen the trouble on swede turnips in Ont. (E. G. Anderson, L. C. Callbeck).

WATERMELON

ANTHRACNOSE (Colletotrichum lagenarium). About 50% of the fruits were affected in a 1/2-acre field at Pont Viau, Que.; some stem lesions were severe (E. Lavallee).

IV. DISEASES OF FRUIT CROPS

A. POME FRUITS

APPLE

FIRE BLIGHT (Erwinia amylovora). A specimen of Yellow Transparent was ived from Victoria, B.C. (J.B. Julien, H.N. Racicot). A survey in early indicated little spread in Alta.; a few severely infected trees were seen, but rally only old cankers could be found (L.E. Tyner). Blight was not prevalent rab apples at Edmonton (A.W. Henry). It was observed occasionally on crabs skatoon, Sask., but was not serious (H.W.M.). Seedling crabs with tip blight e received from Moose Range, Sask., where infection was stated to be heavy nursery. Two-year-old trees of Yellow Transparent received from Bowmanville, ; the rate of infection was low. Moderate infections were seen in several ards of Northwestern Greening and Tolman Sweet in the Niagara Peninsula . Chamberlain). Fire blight seemed to be more widespread in Ont. than in nt years. The pathogen was isolated from apple twigs from London, Guelph Toronto areas (E.H. Garrard). Specimens were received from Seeley's Bay Strathroy (H.N. Racicot, J.B. Julien). In southwestern Que. blight was ted to isolated trees except for one orchard at Havelock Center (F. Godbout). ction was a trace at St. Sylvère, Nicolet Co. (H. Généreux). A specimen was ived from Fredericton, N.B. (H.N. Racicot).

STORAGE ROT (Gloeosporium spp.). In April 1951, 80% of lesions on hern Spy and 20% of those on Golden Russet at Kentville, N.S., yielded pure ures of G. album (K.A. Harrison). Trace infections of G. fructigenum Berk., spore masses greyish, and G. rufomaculans (Berk.) Thuem., with spore ses pink, were seen at Kentville in Feb. 1951 (J.F. Hockey). The last two nisms are considered by some authorities to be variants of the conidial stage lomerella cingulata.

RUST (Gymnosporangium clavipes). Traces of pycnia were found in most ards examined in N.S., but aecia were found on only one of several thousand cted fruits. Lesions were on pedicels as well as fruit (J.F. Hockey).

PERENNIAL CANKER (Neofabraea perennans). Limb cankers were general ewtown and Jonathon in the Kelowna district, B.C. (D.L. McIntosh).

BLACK ROT (Physalospora obtusa) was more general than usual on Northern and King in N.S., conspicuously affecting the calyx end of the fruit. The fungus wed spray or mechanical injury (J.F. Hockey).

POWDERY MILDEW (Podosphaera leucotricha) was common in the Saanich rict, B.C. (W. Jones). It was general on leaves and fruit of Jonathon and ntosh in the Okanagan Valley, but damage was slight (D.L. McIntosh).

BRANCH ROT (Schizophyllum commune). Specimens were sent in from old orchards at Kindersley and Marshall, Sask. (T. C. Vanterpool).

CANKER (Tympanis conspersa). Specimens with the Pleurophomella stage in fruit were received from Maple, Ont. (G. C. Chamberlain, J. W. Groves). Previously reported from N. S. (P. D. S. 30:96).

SCAB (Venturia inaequalis). A single affected fruit of Wealthy was brought in from Burnaby, B. C., in June (I. C. MacSwan). At Penticton and Kelowna, some leaf infection and pin-point lesions on fruit were seen on McIntosh at harvest (D. L. McIntosh). Scab was moderately heavy (80-90% of fruit) in unsprayed orchards of all varieties in the western Kootenays, but was adequately controlled by lime sulphur in concentrate sprayers. In Creston Valley it was much more severe (90-100% of fruit and heavy defoliation), largely as the result of two wet periods, the first from prepink to late calyx stage and the second from late August to the end of picking. Most growers were able to control spring and summer scab, but pin-point infection was heavy in most orchards. Pin-point scab was much less severe where ferbam with wettable sulphur was substituted for lime sulphur in the second cover spray (M. F. Welsh).

In the Guelph district, Ont., foliage infection was heavy at the end of July except in two small, very carefully sprayed orchards. Except in these two orchard infection of the young fruit was moderate to heavy and many had dropped (C. B. Kell Scab was severe on McIntosh and other varieties in most of the Niagara Peninsula. The fruit was worthless in unsprayed and many poorly sprayed orchards, but many growers achieved good control. In the laboratory orchard infection of harvested fruit ranged from 0.35 to 54.1% according to treatment, but unsprayed trees were partially defoliated and no fruit could be harvested (G. C. Chamberlain). In Southwestern Que. scab was quite heavy and losses were heavy in some orchards. In the fall pin-point scab developed in most orchards (F. Godbout). It was kept under fair control except in the Frelighsburg district where prolonged spring rains favoured its early development. In Rouville Co. the main infection periods were 11-12 May, 27-28 May, 14-15 June and 18 June. Most growers sprayed thoroughly and all at the right time; and little spread occurred except for pin-point scab in mid September on late varieties, which resulted from heavy rains. Ferbam controlled pin-point scab better than the wettable sulphurs (L. Cinq-Mars). Scab was heavy on a few trees at St. Thomas, Joliette Co., and moderate at Sacré Coeur, Rimouski Co. (H. Généreux).

At Fredericton, N. B., ascospores were mature on 28 April and discharges took place on 7, 11 and 12 May. Heavy rain in July caused a scab epidemic. Infecti ran up to 100% in poorly sprayed orchards, but there was no late, pin-point infectio (J. L. Howatt). April was wet and cool in N. B. with almost continuous rain 15-28 April. On 1 May apple buds were in the early delayed dormant stage and ascospore were fully developed in the old leaves. The first ascospore discharge occurred on 7 May when apple buds were in the delayed dormant to late delayed dormant stage. Heavy ascospore discharge occurred on 11 May. Heavy rains occurred from 24 Ma to 9 June. Scab infection was noted on 8 June at Upper Hampstead, and on 14 June it was very prevalent on unsprayed trees. The weather during the first two weeks

June, although somewhat cool and cloudy was very favourable for the development the pathogen. In commercial orchards where sprays could be applied on time before infection periods, good control of scab was obtained. However, severe ection occurred in a few orchards not properly sprayed. (S. F. Clarkson). In S. an open winter allowed early development of the pathogen, mature ascospores ng found on 18 April in several parts of the Annapolis Valley. The first infection riod was 25-26 April when early varieties were in the green tip stage. The most vere infection periods were 11-13 May, 23-25 May, 28-30 May, 4-5 June and 16 June. No ascospores discharged in spore traps after 23 June. Primary in- tion was seen on 19 May. Heavy infection resulted where sprays were poorly ed or a protective spray was used after rain instead of an eradicant. Several owers had good results in their first use of the new eradicant materials (J. F. ckey). In P. E. I. scab was extremely severe on unsprayed trees and was serious en in well-sprayed orchards (R. R. Hurst).

MOSAIC (virus). A single grafted tree of Early McIntosh was seen at Water- vn, Ont. (G. C. Chamberlain). Three Bethel trees at the Station, Fredericton, B., that have shown a marked interveinal mottle for 11 years continue to make rmal growth. A seedling in the Laboratory orchard has shown severe leaf ttling and distortion. It is now severely dwarfed and the fruit is very small J. MacLeod).

BITTER PIT (physiological) affected 5% of the fruit of a few trees of Northern in Lincoln Co., Ont. (G. C. Chamberlain). Affected specimens of very large it from young, vigorous trees of Delicious were brought in from Coldbrook, S.; but in general there was very little loss from bitter pit this year (K. A. rrison).

CHLOROSIS (lime-induced iron deficiency). In many localized areas in the anagan Valley, B. C., apples and other tree fruits are severely affected. The l in such areas is usually very moist, especially in spring, and there is a marked dency for salts to accumulate (C. G. Woodbridge).

CHLOROSIS (manganese deficiency) was severe in several areas, and slight moderate deficiencies were found in most sections of the Okanagan and Similkameen lleys, B. C. The deficiency can be cured by spraying with manganese sulphate G. Woodbridge).

CROWN ROT (cause undetermined). Several mature trees of Joyce in nford Twp., Wentworth Co., Ont., showed extensive rotting at the crown, r growth and die-back. The trees were on low, poorly drained land; but rtland, Delicious, McIntosh, Northwestern Greening and Tolman Sweet were ffected (G. C. Chamberlain).

DROUGHT SPOT, etc. (boron deficiency) affected the complete crop of a trees of McIntosh and Winesap at Yale, B. C., on sandy soil from which boron readily leached (C. G. Woodbridge). All the fruit of two trees was severely ected at St. Thomas, Joliette Co., Que. (H. Généreux, R. O. Lachance). One

lot of McIntosh purchased at Charlottetown, P. E. I., showed 1% corky core. Fou specimens brought in showed external cork (R. R. Hurst).

LEAF BLOTCH (magnesium deficiency) has been recognised in the Okanaga Valley, B. C., for many years, but control was not achieved until this year. Six sprays of 2% magnesium sulphate were needed. Soil applications have been ineffective. The trouble caused loss of the crop of affected trees of Newtown (C. G. Woodbridge).

LITTLE LEAF and ROSETTE (zinc deficiency) was again noted on apple in the Okanagan Valley, B. C., and was seen for the first time on pear, prune, peac and cherry. It was also seen on apple in the Creston Valley for the first time. Summer sprays of 1 lb. zinc oxide per 100 gal. greatly reduced the symptoms (C. G. Woodbridge).

MALFORMATION (?poor pollination). Flat-sided and pear-shaped McIntos apples were abundant in N. B. (J. L. Howatt).

RUSSETTING (spray injury). Bordeaux mixture used for the early sprays, during cool weather with slow drying, caused about 20% of the fruit to be russetted in many orchards in N. B. (J. L. Howatt).

SILVER LEAF (cause undetermined) affected scattered trees in the Okanaga Valley, B. C. (D. L. McIntosh).

STEM END ROT (cause undetermined) was general on McIntosh in Queens Co., P. E. I. It is suspected to have been the result of excessive rain and poor growing conditions (R. R. Hurst).

PEAR

FIRE BLIGHT (Erwinia amylovora) was generally severe on Bartlett and Flemish Beauty in the Okanagan Valley, B. C., and was also seen on Anjou. Frui infection and limb girdling were common (D. L. McIntosh). In Creston Valley, in the Kootenays, a few trees are lost each year, especially Bartlett and Flemish Beauty but the rate of loss has dropped in the last two years. Winter pruning, enforced by the provincial Dept. of Agriculture, seems to have been generally successful in spite of wet weather at blossom time. A few serious pockets of blight remain, especially where a number of small orchards are grouped together and enforcement is more difficult. Pear production in Creston Valley has droppe since 1947, despite increased planting, and horticultural officials attribute the decline to fire blight (M. F. Welsh). Blossom and twig blight was seen in a few Bartlett orchards in the Niagara Peninsula, Ont. Several trees of Clapp's Favorite in Ontario had 1/3 to 1/2 of the wood killed although adjacent Bartlett and Flemish Beauty were almost unaffected (G. C. Chamberlain). Fire blight seemed to be more widespread than usual in Ontario. The pathogen was isolated from pears from the Waterford, Markham, Listowell, Collingwood and Waterdown areas (E. H. Garrard).

LEAF SPOT (Mycosphaerella sentina). Infected leaves were received from ursery near Fonthill, Ont. (G. C. Chamberlain).

POWDERY MILDEW (Podosphaera leucotricha). Infection was moderate but mage slight on Flemish Beauty in Creston Valley, B. C. (M. F. Welsh).

TWIG BLIGHT (Sclerotinia fructicola). A trace was found at Pictou, N. S.; st report to the Survey on pear (K. A. Harrison).

SCAB (Venturia pirina). A single affected fruit was brought in from Burnaby, C. (I. C. MacSwan). Foliage and fruit infection was heavy on Flemish Beauty Creston Valley, but the variety is not widely grown (M. F. Welsh). Moderately avy fruit and leaf infection occurred on Bartlett in an orchard in Glanford Twp., entworth Co., Ont. The unusually heavy infection of this relatively resistant riety seemed to be due to close planting (15 ft. x 15 ft.), vigorous growth, poor circulation due to sheltered and low situation, and interplanting with Flemish auty (G. C. Chamberlain). Single unsprayed trees of Bartlett and Clapp's vorite were more heavily infected than in any recent year at Kentville (K. A. rrison).

DIE BACK (boron deficiency). Bartlett trees at Yale, B. C., showed a sudden ssom wilt in June, during full bloom, and developed typical die-back. Analyses icated a normal boron content of the soil but a very low content for the affected sues. Low soil moisture is believed to have interrupted boron transfer through soil. The trees recovered later in the season (C. G. Woodbridge).

LITTLE LEAF and ROSETTE (zinc deficiency). See under Apple.

SUMMER WILT (cause unknown). A condition known locally as summer wilt s first seen at Yale, B. C., in 1948 when only a few trees were affected. No w cases were seen in 1949 or 1950. In 1951 many trees of most varieties were ected in many districts, but there was no evident pattern in the distribution of ected trees in any one orchard. The leaves shrivel, blacken and die, many ually falling, and the crop fails to size up. Tissues of other parts of the trees pear healthy (G. C. Woodbridge).

THIN WOOD (cause unknown) Affected trees of Bartlett, in B. C., make ofuse thin and spindly sucker growth, and bear almost no fruit (C. G. Woodbridge).

B. STONE FRUITS

APRICOT

CORYNEUM BLIGHT (Clasterosporium carpophilum). Infection was very avy on all varieties of apricot and peach in Creston Valley, B. C., 100% of fruit ing affected in unsprayed orchards. Heavy fall rains in 1950 favoured canker velopment. During the severe winters of 1949-50 and 1950-51 many unsprayed d severely cankered trees were killed or seriously damaged, whereas sprayed trees

in adjacent orchards were undamaged. It appears that much of the killing of apricot and peach in the Kootenays attributed to winter injury has occurred only because the trees were weakened by Coryneum blight (M. F. Welsh).

CANKER (Valsa sp.). Branch and limb killing followed infection by Valsa sp. through pruning stubs at Niagara-on-the-Lake, Ont. (G. C. Chamberlain).

WILT (Verticillium albo-atrum). The pathogen was isolated from the affected trees of Moorpark at Osoyoos, Summerland and Vernon, B. C. (G. E. Woolliams).

FROST INJURY. The apricot crop was reduced to about 10% of normal in the Okanagan Valley, B. C., by an exceptionally severe frost on the night of 19 April, during bloom, which killed the ovaries. The minimum at the Summerland Experimental Station was 14° F.

SILVER LEAF (cause undetermined) was severe in June on some apricots in the southern part of the Okanagan Valley, B. C., following very low winter temperatures (D. L. McIntosh). The association of silver leaf with winter injury has been noted previously (P. D. S. 24: 84. 1945).

CHERRY

DIE BACK (Cytospora sp. associated) caused slight damage to sweet cherry at Kentville, N. S. (C. O. Gourley).

BLACK KNOT (Dibotryon morbosum) was heavy on sour cherry at one locati in Queens Co., P. E. I. No other reports were received, but it was heavy on wild Prunus (R. R. Hurst).

SHOT HOLE (Higginsia hiemalis) was light on foliage of all sweet cherry orchards examined in the Boswell--Kootenay Bay Section of the Kootenays, B. C., but no pedicel infection was seen (M. F. Welsh). Shot hole was heavy at Arkona, Middlesex Co., the Niagara Peninsula and near Hamilton, Ont., on sweet and sour cherries, and caused partial defoliation in late summer (G. C. Chamberlain). It caused considerable defoliation of young trees in a nursery at Rougemont, Que. (L. Cinq-Mars). Infection ranged from trace to heavy in Prince Co., P. E. I. (J. E. Campbell).

CROWN ROT (Phytophthora cactorum). The pathogen was isolated from the bark of a girdled tree of Van sweet cherry at the Station, Summerland, B. C. (D. L. McIntosh). First report to the Survey on this host.

POWDERY MILDEW (Podosphaera oxyacanthae) was general on sucker growt of Bing and Lambert sweet cherries throughout the Summerland area, B. C. (D. L. McIntosh). Seedling sweet cherries were infected at Seton Lake (G. E. Woolliams). All sweet cherry varieties were very lightly infected in the Kootenays (M. F. Welsh Infection was a trace on tip growth of young Montmorency sour cherries in Wentworth Co., Ont. (G. C. Chamberlain). Several trees of Montmorency were heavily infected at Smiths Falls (H. N. Racicot).

BLOSSOM BLIGHT and BROWN ROT (Sclerotinia fructicola and S. laxa). ɔssom infection was moderately heavy on sweet cherries in the West Kootenay trict, B. C., and there was some rotting of green fruit; but dry weather at king time checked its spread. No brown rot was noted in Creston Valley . F. Welsh). At the laboratory, St. Catharines, Ont., blossom and stem rot fructicola) on sweet cherries was: Yellow Spanish 22.0%, Velvet 17.0%, Gov. od 6.8%, Schmidt 6.4%, Black Tartarian 3.2%, Elkhorn 2.8%. Brown rot came increasingly important during the sweet cherry harvest, averaging about on 10 July and 10-15% on 17 July (G. C. Chamberlain). S. fructicola fruited specimens of Hansen's bush cherry sent in from Abbotsford, Que. (H. N. cicot, J. B. Julien).

LEAF CURL and WITCHES' BROOM (Taphrina cerasi). A seedling sweet erry at Crawford Bay, B. C., had most of the foliage affected and was of no mmercial value (M. F. Welsh). Mix (Univ. Kans. Sci Bull. 33, pt. 1, no. 1. 49) indicates that T. minor, regarded as the cause of cherry leaf curl, is not stinct from T. cerasi, the witches' broom pathogen (D. B. O. S.).

WILT (Verticillium sp.). Affected orchards of Montmorency sour cherry were en in June near Waterdown, Fonthill, Vineland and St. Catharines, Ont. In me, but not all, cases cherries are known to have followed or been interplanted th tomatoes. Growth was stunted, leaves were small and delayed, and wood was ɔically discoloured. Six trees of Hedelfingen sweet cherry were partly defoliated a mixed planting in Wentworth Co., but Windsor was unaffected (R. S. Willison, C. Chamberlain).

LITTLE CHERRY (virus). Symptoms were less severe than usual in most eet cherry orchards in Creston Valley, B. C., probably because the crop was astically reduced by spring frosts. The variety Van, now in commercial oduction in two orchards, bore a normal crop and showed no symptoms. Elsewhere in the Kootenays symptom severity was about average. Some Bing could be ld as fresh fruit in a year of short crops, but most were processed. The crop was rmal to heavy in most orchards. The crop of Van was very heavy at Kaslo and ality lower than usual, but all fruit reached the standard for sale as fresh fruit . F. Welsh).

NECROTIC LEAF SPOT (virus). Severe shock symptoms were seen on about % of a block of 6-8 year-old Montmorency sour cherries in the Niagara Peninsula, t. (G. C. Chamberlain).

RASP LEAF (virus). A few trees (less than 1%) were affected in a 2-3 year l Montmorency block in Lincoln Co., Ont., not previously surveyed. The disease s first recorded in another orchard in 1950. Rasp leaf of sweet cherry (?virus) ected 2/345 trees of Windsor in a Lincoln Co. orchard surveyed for 5 years . S. Willison).

Table 10. Virus Disease Survey of Sour Cherry Orchards

Symptom or disease	Repeat surveys Frequency in 1951 No.	%	New in 1951 No.	%	New surveys 1951 No.	%
Cherry yellows (suspected)	47	2.5	38	2.0	48	3.8
Cherry yellows	294	15.5	72	3.8	344	27.4
Shock symptoms*	17	0.9	13	0.7	2	0.2
Etching, etc. (chronic necrotic ring spot)	240	12.6	101	5.3	1	0.1
Rasp leaf	4	0.2	1	0.05	7	0.5
Mottle and ring patterns	30	1.6	27	1.4	1	0.1
Narrow leaf (?)	5	0.3	5	0.3	4	0.3
Green ring yellows	7	0.4	0		0	0
Abnormal fruits**	0		0		1	0.1
Tatter leaf (suspected)	13	0.7	13	0.7	0	0
Total	657	34.6	270	14.2	408	32.5
Combinations of symptoms	55	2.9	120	6.3	3	0.2
Trees visibly affected 1951	602	31.7	150	7.9	405	32.3
Trees previously affected but symptomless in 1951	364	19.2			-	-
Trees "healthy" 1947-1951	935	49.1			851	67.7
Total trees surveyed	1901	100.0	-	-	1256	100.0
Grand Total	1371 diseased 43.4%	+	1786 "healthy" + 56.6%	= 3157 trees = 100.0%		

*7 trees showed shock after showing symptoms in previous years.

**In addition to that associated with green ring yellows infection.

Table 11. Virus Disease Survey of Sweet Cherry Orchards

Symptom or disease	Repeat surveys: Frequency in 1951 No.	Repeat surveys: Frequency in 1951 %	Repeat surveys: New in 1951 No.	Repeat surveys: New in 1951 %	New surveys 1951 No.	New surveys 1951 %
ttle, ring and line patterns	377	30.6	77	6.3	163	20.8
crotic spotting (small spots)	19	1.5	13	1.0	20	2.6
tter leaf	84	6.8	13	0.1	27	3.5
tter leaf (suspected)	16	1.3	11	0.9	20	2.6
inkle or pseudo-crinkle	282	22.9	228	18.5	18	2.3
tle leaf (?)	11	0.9	11	0.9	14	1.8
sp leaf	4	0.3	4	0.3	1	0.1
ld rugose mosaic (?)	2	0.2	0	0	0	0
mbert 'spot'	1	0.1	1	0.1	2	0.2
tal	796	64.6	358	29.1	265	33.9
mbinations of symptoms	154	12.5	253	19.8	43	5.5
ees visibly affected in 1951	642	52.1	105	9.3	222	28.4
ees previously affected but symptomless in 1951	359	29.1	-	-	-	-
ees "healthy" 1947-1951	231	18.8	-	-	561	71.6
tal trees surveyed	1232	100.0			783	100.0
and Total	1223 diseased	+	792 "healthy"	= 2015		
	60.7%	+	39.3%	= 100.0%		

Dr. R.S. Willison has communicated his observations in a special report, "Virus Disease Survey in the Niagara Peninsula, Ont."

Tables 10 and 11 summarize the data for 1951. There is indication of multipl strains of necrotic ring spot and yellows of sour cherry. Symptom expression varies from year to year and from orchard to orchard, but does so independently for these two diseases. Green ring yellows spreads very slowly if at all. Most of the sour cherry orchards consist of Montmorency. The figures for some disea of sweet cherry change greatly from year to year because of variations in maskin and symptom expression. The figures for pseudo-crinkle are subject to revision, owing to difficulty in diagnosis. Little leaf, not previously recorded, is suspecte to be due to a virus; the crop is affected.

CROWN AND ROOT INJURY (lack of drainage). Wet soil and poor aeration were apparently responsible for damage to 15-20% of the trees in a Montmorency orchard near St. Thomas, Ont.; some trees were dying when examined in June. Several scattered cases of the same condition were seen in Lincoln Co. and the Oakville district (R.S. Willison).

CHEMICAL INJURY. Leaf drop occurred in a Montmorency orchard in the Niagara Peninsula, Ont., in June, following a late application of cyanamid (G.C. Chamberlain).

FROST INJURY. The sweet cherry crop was reduced to about 10% of normal in the Okanagan Valley, B.C., by unseasonably low temperatures just before full bloom. The minima at Summerland for the nights of 19, 20, and 21 April were 14, 19 and 25°F. Almost all ovaries of flowers near the ground were killed, but a higher proportion were uninjured near the tops of the trees (G.E. Woolliams).

LITTLE LEAF and ROSETTE (zinc deficiency). See Apple.

NECTARINE

LEAF CURL (Taphrina deformans). Infected fruit were seen in a home garde at West Vancouver, B.C. Both fruit infection and occurrence of the pathogen on nectarine are uncommon (H.N.W. Toms, I.L. Conners).

PEACH

SCAB (Cladosporium carpophilum) caused some defoliation at the Station, Kentville, N.S. Recorded previously from this district only on fruit (K.A. Harri

CORYNEUM BLIGHT (Clasterosporium carpophilum). Fruit lesions caused slight damage at Penticton, B.C. (D.L. McIntosh).

DIE BACK (Cytospora sp.) caused moderate damage at Kentville, N.S. pecially to the new growth of young trees (C.O. Gourley).

POWDERY MILDEW (Podosphaera oxyacanthae). Considerable infection curred on fruit of a few trees in a garden at Salt Spring Island, B.C. (W. Jones).

POWDERY MILDEW (Sphaerotheca pannosa) was prevalent on Golden Jubilee, berta and Vedette in Niagara Twp., Lincoln Co., Ont. Many fruit were marked a small, isolated block (G.C. Chamberlain).

LEAF CURL (Taphrina deformans) was found at Summerland, B.C., on dette and other varieties growing within 500 ft. of the lake, but not further from shore. Scattered infections occurred in the area (G.E. Woolliams, D.L. McIntosh). roughout the Kootenays heavy spring rains favoured leaf curl and infection was 0% in most unsprayed orchards. The late September sprays of ferbam and ttable sulphur, Bordeaux mixture, or fixed copper, for Coryneum blight, gave cellent control of leaf curl (M.F. Welsh). Scattered infections were seen in ncoln Co., Ont., where spraying was not timely or thorough. In unsprayed chards leaf curl was epidemic (G.C. Chamberlain). At Middleton, N.S., a rmant spray with Perenox was ineffective and allowed 50% leaf infection on d Haven (K.A. Harrison).

WILT (Verticillium sp.). Several cases were found in young plantings of berta at St. Catharines and Niagara-on-the-Lake, Ont.; affected trees showed nsiderable defoliation in July (G.C. Chamberlain).

BARK KILLING (rabbit repellant). The application of a commercial repellant abbit-Scat) to 3-year-old Elberta trees in Lincoln Co., in the fall, was followed the death of 90% of the trees due to killing of the bark on the trunks. This aterial has not given rise to complaints when used on other tree fruits. It is lieved that the open fall and the grower's cultural practices delayed the onset of rmancy and contributed to the injury (G.C. Chamberlain).

BUD FAILURE (cause unknown). The fruit buds of trees of several varieties the Okanagan Valley, B.C., started to swell in the spring and then abruptly ed and sloughed off (C.G. Woodbridge).

CROWN ROT (lack of drainage). Poor drainage and heavy fall and spring infall combined to kill many young trees of Golden Jubilee and Fisher in the agara Peninsula, Ont. (G.C. Chamberlain).

LITTLE LEAF and ROSETTE (zinc deficiency). See Apple.

PLUM

SCAB (Cladosporium carpophilum) was severe on some trees, causing almost l the fruit to drop, but only slight on others at Kirks Ferry, Que. (H.N. Racicot).

BLACK KNOT (Dibotryon morbosum). The eradication campaign in the Frase Valley, B.C., has been continued, mainly in the Chilliwack and Mission--Hatzic areas, with the co-operation of District Agriculturists and Horticulturists, variou agricultural organizations, and the Indian Affairs Branch. Publicity has been directed through window displays, talks, press, and radio, and its effect is being reflected in the increased efforts by growers. This eductional program is now being supplemented by a control program. There is much work to be done on private farms, abandoned estates and Indian reservations. It is hoped that abandoned plum and prune trees may be killed by chemical means. It should be emphasized that to date black knot has been found in the Fraser valley only on domesticated plum and prune, except for a trace on apricot (P.D.S. 26:67, and 27:87) at Agassiz. No infection has been found on native Prunus. Italian prune is moderately susceptible and all varieties of plum appear to be highly susceptible (I.C. MacSwan). Specimens of plum were received from Wellandport, Ont., with the statement that it was common in a small planting. A few scattered knots were found in a planting of Stanley prune in Lincoln Co. (G.C. Chamberlain). Black kn was heavy in thickets of wild plum near Kentville, N.S. At the station the spray program keeps the disease in check, but new knots must be cut out of a number of trees each spring (K.A. Harrison). A trace was seen on one tree in Queens Co., P.E.I. (R.R. Hurst).

BROWN ROT (Sclerotinia fructicola). Despite a very light crop, a small amount of rot was found on Stanley prune at Kentville, N.S. Some twig blight was also suspected to be due to S. fructicola (K.A. Harrison).

SILVER LEAF (Stereum purpureum). A tree of Victoria was severely affecte at Keating, B.C. (W. Orchard).

PLUM POCKET (Taphrina communis). Infection was reported to be 30% at Pelley and 15% at Struan, Sask. (T.C. Vanterpool). Infection was 100% on Burba near Berwick, N.S. (C.O. Gourley). Prunox gave no control as a dormant spray on an unidentified variety at Middleton, and infection was 95% (K.A. Harrison).

BACTERIAL BLIGHT (Xanthomonas pruni) was considerably lighter than usua on Burbank at the Station, Kentville, N.S. (C.O. Gourley).

CROWN ROT (lack of drainage). A young block of 60 trees of mixed varieties in the Niagara Peninsula, Ont., showed poor growth in July and some trees were dead. Extensive crown injury was present and was attributed to poor drainage and heavy rainfall. See also Cherry and Peach (G.C. Chamberlain).

LITTLE LEAF and ROSETTE (zinc deficiency). See Apple.

SPRAY INJURY. Cankers on Japanese plum, apparently due to arsenical injury and later invaded by Valsa sp., caused die-back in Clinton Twp., Lincoln Co., Ont. (G.C. Chamberlain).

SWOLLEN NODES (boron toxicity). Boron toxicity symptoms on stone fruits are being studied in sand culture experiments at Summerland, B.C. One symptom on prune and apricot, which has also been seen in the field and in plot tests, is a great enlargement of the nodes (C.G. Woodbridge).

C. RIBES FRUITS

CURRANT

LEAF BLIGHT (Botrytis cinerea) caused the loss of a few lower leaves of ronet and Crusader black currants at Kentville, N.S. (C.O. Gourley).

WHITE PINE BLISTER RUST (Cronartium ribicola) caused slight damage to ck currant in a garden at Sidney, B.C (W. Jones). Infection was light on skoop Giant black currant in Creston Valley, (M.F. Welsh). It was heavy on 16 varieties of red currant under test at the Station, Kentville, N.S. (C.O. Gourley). ection was moderate on currants at Springfield, P E.I. (J.E. Campbell).

ANTHRACNOSE (Drepanopeziza ribis) was severe on specimens from Ottawa, . (A.T. Bolton). It was light on many varieties of red and black currant at the tion, Kentville, N.S. (C.O. Gourley). Infection was light at Springfield, P.E.I. E. Campbell).

SEPTORIA LEAF SPOT (Mycosphaerella grossulariae) was rather general on ronet black current in Ancaster twp., Lincoln Co., Ont., causing partial oliation (G.C. Chamberlain).

CANE BLIGHT (Nectria cinnabarina) affected a number of canes in a thicket escaped plants at Barton, N.S. (K.A. Harrison).

POWDERY MILDEW (Sphaerotheca mors-uvae) was destructive at Donalda and verly, Alta. (A.W. Henry) It was heavy on specimens of Ribes glandulosum llected on Brabant I., Great Slave L., by W.H. Lewis; this collection is possibly northernmost record of the pathogen in Canada (D.B.O. Savile). Black currants re severely affected near Saskatoon, Sask.; rainfall and humidity were above erage (H.W.M.). Mildew was moderate on Coronet and Crusader black currants the Station, Kentville, N.S. (C.O. Gourley) and heavy on specimens of Crusader ceived from Pasadena, Nfld. (H.N. Racicot).

DIE-BACK (Thyronectria berolinensis (Sacc.) Seaver associated). This fungus ited abundantly on dead canes of red currant pruned out and lying on the ground St. Catharines, Ont. The canes had also been attacked by the currant cane borer, l the pathogenicity of the fungus has not been proved (W.G. Kemp). Not previously ported in the Survey, but there are several specimens in the Mycological Herbarium m Ont., and one from Man. on Ribes spp. (I.L. Conners).

GOOSEBERRY

WHITE PINE BLISTER RUST (Cronartium ribicola) was heavy on 13 varieties the Station, Kentville, N.S., and caused much defoliation (C.O. Gourley).

ANTHRACNOSE (Drepanopeziza ribis) was light on several varieties at the tion, Kentville, N.S. (C.O. Gourley).

POWDERY MILDEW (Sphaerotheca mors-uvae) was heavy on fruit from a garden in the Steveston area, Lulu I., B.C. (N.S. Wright). Infection was light at Lacombe and moderate at Edmonton, Alta. (T.R.D.). Mildew reduced the yield of marketable fruit of English gooseberry by 10% in a planting in Ancaster Twp., Wentworth Co., Ont. (G.C. Chamberlain). Specimens were received from Almonte with the statement that 2% of the fruit was affected (H.N. Racicot). Infection was light on Poorman at Kentville, N.S., destroying some lower leaves (C.O. Gourley).

D. RUBUS FRUITS

BLACKBERRY

CROWN GALL (Agrobacterium tumefaciens). A trace was found at New Mina N.S. (C.L. Lockhart).

LOGANBERRY

DRY BERRY (Haplosphaeria deformans) was heavy at Egmont, B.C. (R. Stace-Smith).

RASPBERRY

CANE GALL (Agrobacterium rubi). Considerable infection occurred on fruit canes in a garden at Courtenay, B.C. (W. Jones).

CROWN GALL (Agrobacterium tumefaciens). Specimens of black raspberry with galls spreading up on to the canes were received from Norval, Ont.; possibly due to A. rubi (E.H. Garrard). Crown gall was found in all varieties grown at th Station, Ste. Anne de la Pocatiere, Que. (A. Payette). Galls were found up to 2 f from the ground on the old canes of Newburg and Taylor at Kentville, N.S. Infect was about 1% (K.A. Harrison). Infection was a trace on Lloyd George and Viking in a garden at Charlottetown, P.E.I., but the infected plants were severely dama Two infected specimens of Lloyd George were brought in (R.R. Hurst).

CANE BLIGHT (Botrytis cinerea) was found at Kentville, N.S., on Newburgh Taylor, Trent, Viking and Washington grown under sawdust mulch, but plants und clean cultivation were unaffected (J.F. Hockey).

SPUR BLIGHT (Didymella applanata). Almost every cane in a 1/2 acre plant of Madawaska at Port Stanley, Ont., bore 1-3 lesions. The rows were thick and the site had poor air drainage (G.C. Chamberlain). Specimens were received from Belleville and Seeley's Bay (H.N. Racicot). Spur blight was found in 8 field in southwestern Que. late in the season, but damage was very light (L. Cinq-Mar A moderate infection was seen at Melvern Square, N.S. in the spring. Several specimens were brought in by growers. Only a trace occurred in the spray plots at the Station, Kentville (K.A. Harrison). A 10% infection was seen on Latham i Prince Co., P.E.I. (R.R. Hurst).

ANTHRACNOSE (Elsinoe veneta). In a varietal planting at Vineland, Ont., tineau, Lloyd George, Madawaska, Rideau, Taylor and Trent proved to be very sceptible, over 80% of the canes being moderately to severely affected. Herbert re a light infection on 20% of the canes. Chief, Cuthbert, Latham and Viking re a very light infection on less than 5% of the canes (W. G. Kemp). Heavily ected Columbian purple raspberry specimens were received from Prince ward Co.; the fruit was stated to have dried up (G. C. Chamberlain). A light ection was found at Deschambault, Que. (L. Cinq-Mars). Infection in Levis, llechasse and Montmagny Counties was heavy enough to reduce the yield preciably. The injury was most conspicuous at harvest (O. Caron). At Kentville, S., Taylor and Washington proved very susceptible. All varieties are commonly ected but Newburgh and Viking are sufficiently resistant to escape severe damage. was also reported from Annapolis and Inverness Counties (K. A. Harrison). ection was trace to moderate on Latham in Queens Co. (R. R. Hurst).

CANE BLIGHT (Leptosphaeria coniothyrium). A number of infected specimens Viking were brought in from Kings and Annapolis Counties, N. S. (K. A. Harrison).

CORAL SPOT (Nectria cinnabarina). A single infected cane of Trent was seen a dense planting at Kentville, N. S. (K. A. Harrison).

YELLOW RUST (Phragmidium rubi-idaei) caused considerable damage to shington at Brentwood and Chemainus, B. C. (W. Jones). Infection was general d heavy on the lower leaves in a 2-acre planting of Washington at Vancouver, C. (I. C. MacSwan). Infection was heavy, but caused slight damage, on Washington Mt. Lehman in the lower Fraser Valley, but in most places the summer was too y to permit much infection (H. N. W. Toms) Viking was commonly infected in Midland and Penetanguishene districts Ont., and suffered some defoliation C. Chamberlain).

LATE YELLOW RUST (Pucciniastrum americanum) was heavy on old canes d light to moderate on new growth of Viking at Guelph, Ont. (C. B. Kelly). Fruit ection was 10% or more in several lots of Viking at Kentville, N. S. Later in season Viking at the Station was 100% infected and heavily defoliated. Other rieties suffered little defoliation (K. A. Harrison).

POWDERY MILDEW (Sphaerotheca humuli). A specimen was received from nalda, Alta. (A. W. Henry). Traces were seen at Lacombe and Edmonton (T. R. D.). acre of Latham in a sheltered location at Lucan, Ont., was heavily infected and ne growth severely stunted (G. C. Chamberlain) Mildew was seen on Latham a nursery at Abbotsford, Que. (L. Cinq-Mars).

VERTICILLIUM WILT (V. albo-atrum) killed 15% of a 3-year-old Viking ntation at St. Catharines, Ont. The grower destroyed the whole planting. It s moderately severe in a low area of a 2-year-old Viking plantation in Wentworth . This disease is often seen in young plantations. Sunrise has proved very sceptible at St. Catharines (G. C. Chamberlain).

CRUMBLE BERRY (?virus) was found on Washington in the Abbotsford distric B. C. Plants have been taken for indexing (R. Stace-Smith, R. E. Fitzpatrick). Previously reported from Oregon on black raspberries. See Vanghan et al. U. S. D. A. P. D. R. 35:34-37. 1951

LEAF CURL (virus) severely stunted 2% of a planting of Taylor in Lincoln Co., Ont. (G. C. Chamberlain).

MOSAIC (virus). Between 10 and 20% infection was seen in a 4-year-old 3-acre planting of Viking at Midland, Ont. Infected plants were severely stunted. Infection was 2-5% in Newburgh at Arkona, Ont. Its occurrence in this variety is unusual (G. C. Chamberlain). Mosaic was seen in 10-19 plantings inspected for certification in Que.; infection ranged up to 2% (L. Cinq-Mars). Infection was 7% in a Latham plantation at Upper Maugerville, N. B. (D. J. MacLeod). Infection was 10% in a planting at Frizzleton, N. S. Moderate to severe damage was also reported in plantings at Kentville, Wolfville and Berwick (P. M. Grainger D. W. Creelman). Mosaic was occasional, but damage severe, in two plantings of Lloyd George at Charlottetown, P. E. I. A trace was seen on Latham in Prince Co. (D. B. Robinson, R. R. Hurst).

ROOT and CROWN INJURY (wet soil). Low-lying areas in several fields or garden patches of Washington were damaged near Vancouver, B. C., during the winter or spring. The succeeding dry summer aggravated the injury (I. C. MacSw

E. OTHER FRUITS

BLUEBERRY

CROWN GALL (?Agrobacterium tumefaciens). Galls were found on Burlingto Cabot, Charlotte, Dixie, Stanley and Weymouth varieties in coastal B. C. Bacteri were isolated but not tested for pathogenity. The disease has been seen only in varieties introduced into B. C. in recent years (R. E. Fitzpatrick, I. C. MacSwan). J. B. Demaree and N. R. Smith (Phytopath. 42:88-90. 1952) report the occurrence of what is evidently the same disease, caused by a strain of A. tumefaciens, from N. J., Wash. and B. C. See also P. D. S. 12:68 for a previous report from B. C.

BLOSSOM and TWIG BLIGHT (Botrytis cinerea). Traces were seen in June on Vaccinium angustifolium at Steam Mill and V. corymbosum at Morristown, N. S (D. W. Creelman). Botrytis sp. was seen commonly in coastal B. C., but apparen only on growth that had been winter-killed (I. C. MacSwan, R. E. Fitzpatrick).

RED LEAF (Exobasidium vaccinii). Infection was 1-5% on Vaccinium angusti folium, V. brittonii and V. myrtilloides at Steam Mill, N. S. (D. W. Creelman).

CANKER (Godronia cassandrae). Atlantic, Jersey and Pemberton seem to be particularly susceptible in coastal B. C. No cankers were seen on the current season's growth, probably because of the extremely dry weather, (R. E. Fitzpatri I. C. MacSwan). It was fairly prevalent on high-bush blueberry in the Fraser Valley (W. Trouzeau). Canker caused moderately heavy damage in a commercial planting of high-bush blueberry at Centreville, N. S. (D. W. Creelman).

TWIG BLIGHT (Pullularia pullulans assoc.). Blighted twigs of Vaccinium ustifolium from Charlotte Co., N.B., bore abundant fructifications of pullulans, but its relationship to the injury is not known (D. W. Creelman).

TWIG and BLOSSOM BLIGHT (Monilinia vaccinii-corymbosi (Reade) Honey Botrytis cinerea). Specimens were received from five locations in Charlotte ., N.B., bearing both pathogens. Several areas of perhaps an acre were ted to be completely dead (D. W. Creelman). Previously reported (P. D. S. 28:91) ler Sclerotinia oxycocci.

LEAF RUST (Thekopsora vacciniorum). Specimens of Vaccinium angustifolium m Tower Hill, N.B., were heavily infected and showed considerable defoliation W. Creelman).

CRANBERRY

FRUIT ROTS. The following data summarize identified isolates made from red fruit in N.S., during several years, in January unless otherwise stated. burn, Berwick and Lakeville, 1946: Godronia cassandrae 48.0%, Guignardia ccinii 6.9, Sporonema oxycocci 6.7, Pestalotia vaccinii 4.7, Acanthorhynchus ccinii 4.1, Ceuthospora lunata 3.1, Glomerella cingulata 1.0, Diaporthe vaccinii 3. Arichat, Richmond Co., 1946 Godronia cassandrae 48.0%, Pestalotia vaccinii 0, Ceuthospora lunata 7.0, Glomerella cingulata 6.0, Sporonema oxycocci 4.0, rile breakdown 10.0. Mountain cranberry (Vaccinium vitis-idaea var. minus), aver River, Sept. 1949: Sporonema oxycocci 55%, Guignardia vaccinii 13, nicillium sp. 8, sterile breakdown 19. Beaver River, 1951: Godronia ssandrae 82.0%, Sporonema oxycocci 15.0, Acanthorhynchus vaccinii 1.0, trytis sp. 1.0, Penicillium sp. 1.0. Ceuthospora lunata and Guignardia vaccinii re isolated from other fruits received from Beaver River (K. A. Harrison).

GRAPE

DEAD ARM (Fusicoccum viticola) is widespread in Concord vineyards in the agara Peninsula, Ont. Infection was 9.1-16.4, av. 13.0% in 11 plantings of this riety. In single vineyards of other varieties infection was: Agawam 19.1%, tawba 3.1%, Elvira 5.9%, Westfield 11.5%, (G. C. Chamberlain).

BLACK ROT (Guignardia bidwellii) attacked the fruit of scattered clusters of ingle European variety in a vineyard in the Niagara Peninsula, Ont. (G. C. amberlain). Infection was severe on a few plants in a garden at Round Hill, napolis Co., N.S. (J. F. Hockey).

DOWNY MILDEW (Plasmopara viticola) was moderately heavy on fruit of esident and Fredonia at St. Catharines, Ont., following humid weather and quent showers in early July. It attacked 17.8% of fruit clusters in the unsprayed rtion of a Fredonia vineyard, but only 0.63-1.06% in the sprayed portions. ecimens were also received from Kent Co. (G. C. Chamberlain).

POWDERY MILDEW (Uncinula necator). Infection was a trace but perithecia abundant on grapes at Kentville, N.S., but only conidia were formed on adjacent Virginia creeper (D. W. Creelman).

CHEMICAL INJURY. Portland was severely damaged by 2,4-D at Stanhope, P. E. I. (J. E. Campbell).

CHLOROSIS. Sixty percent of vines of Concord in one area of a vineyard in Niagara Twp., Lincoln Co., Ont., showed moderate to severe yellowing in July. The severely affected vines commonly showed marginal leaf scorching. In late summer affected vines largely recovered (G. C. Chamberlain).

STRAWBERRY

GREY MOULD (Botrytis cinerea) was severe during wet weather in early July on the fruit of Gem ever-bearing strawberries in a garden at Saskatoon, Sask. It had not been seen locally for 5 years (T. C. Vanterpool). Infection of stems and green fruit caused moderate loss in a planting of Premier in Niagara Twp., Lincoln Co., Ont. The plants were heavily matted and under a straw mulch (G. C. Chamberlain). The sepals and green fruit of Premier and Senator Dunlap were moderately infected at Windermere, N.S. (C. O. Gourley). Infection was 25% in a planting of Jessie at Chebogue, Yarmouth Co. (J. F. Hockey). A 5% infection of Premier was seen in Queens Co., P. E. I. (R. R. Hurst).

LEAF SCORCH (Diplocarpon earliana) was abundant in fields of Senator Dunla at St. Pierre, Montmorency Co., Que., but caused little damage (A. Payette). Small amounts were seen in a few fields in southwestern Que. (L. Cinq-Mars). A trace was seen on Senator Dunlap at Berwick, N.S. (D. W. Creelman). Infectio was a trace on Senator Dunlap and other varieties in Queens Co., P. E. I. (R. R. H

LEAF SPOT (Mycosphaerella fragariae) was heavy in a planting at St. Gérard L'Assomption Co., Que., but caused little damage. Lighter infections were seen in many fields elsewhere (A. Payette). It was general in southwestern Que., but seemed to cause no appreciable damage (L. Cinq-Mars). Infection was 10% in plantings at Mabou and Frizzleton, Inverness Co., N.S. (P. M. Grainger). A tra was seen on Senator Dunlap and other varieties in Queens Co., P. E. I. (R. R. Hur

RED STELE (Phytophthora fragariae) is still a major check on production in parts of the Fraser Valley, B.C. Ridging of the plants to improve drainage seem to be the only practical means of control in heavily infested soil. Many plantings in small holdings on the outskirts of Vancouver are severely affected. The increa use of certified plants has done much to limit spread of the disease (I. C. MacSwa Nearly five million plants were certified in 1951 (W. R. Foster). Infection was 5% in a field of Jessie at Chebogue, Yarmouth Co., N.S., mostly in low areas (J. F. Hockey).

CROWN ROT (Rhizoctonia solani), aggravated by Botrytis cinerea, completel killed 10% of a planting at Ste. Anne de la Pocatière, Que. (A. Payette).

POWDERY MILDEW (Sphaerotheca humuli). Only traces were found throughout e., but a light infection occurred on Sierra in the greenhouse at Ste. Anne de la catière (A. Payette).

WILT (Verticillium sp.), known for many years from parts of the United tes, was found in many parts of Ont. for the first time. Infections ranging om trace to 5% were found at Simcoe, Waterdown, Aldershot, Burlington and kville, as well as many points in the Niagara Peninsula. The outer leaves wilt d turn brown, and the whole plant may be killed. Stolons are scarce and the ngus may spread in them to runner plants. Internal discoloration of the crown curs only in the later stages, but the fungus can be detected earlier by means sections stained in lactophenol and cotton blue, or by surface-sterilizing the own, splitting it lengthwise and placing it in a moist chamber when aerial growth ll be produced along the vascular tissue It is not yet certain whether this tbreak is anything more than the result of perfect soil moisture and temperature nditions (D. L. Bailey). Verticillium wilt was seen in Norfolk, Lincoln and el Co., in a number of plantings that followed tomatoes or potatoes. It caused or growth and death of plants (G. C. Chamberlain).

LATENT VIRUSES of a non-persistent crinkle type were detected in parently healthy British Sovereign and Marshall by indexing on Fragaria vesca C. Mellor, R. E. Fitzpatrick).

MOSAIC (virus). A trace to 2% of mild mosaic was seen in four plantations Senator Dunlap in Queens and Sunbury Co., N. B. (D. J. MacLeod).

WITCHES' BROOM (?virus). A collection of F. glauca made by W. H. Lewis Hay River on the south shore of Great Slave L., was bushy, pale, upright, with nall leaflets and few flowers. This is possibly the same virus disease that B. Demaree and C. P. Marcus (P. D. R. 35: 527-537. 1951) cite as having been corded from Minn., Wis., Ill. and N. Y. (D. B. O. Savile).

JUNE YELLOWS (genetic breakdown) was seen in several new plantings of emier in Lincoln and Norfolk Co., Ont., 5-10% of the plants were affected, ually in small patches (G. C. Chamberlain). It affected 27% of a Premier ntation in Queens Co., N. B. (D. J. MacLeod).

ROOT ROT (cause unknown). Plants of Premier in a poorly drained section a field at Niagara-on-the-Lake, Ont., made little growth. Fibrous roots were cking. Wet soil seemed to have aggravated the damage from root rot C. Chamberlain). Root rot was widespread in Que., but was particularly vere at Cap Santé, Portneuf Co. (A. Payette).

WINTER INJURY. Crown and root injury due to low temperatures was common coastal B. C. (W. R. Foster).

V. DISEASES OF TREES AND SHRUBS

ACER - Maple

Anthracnose (Gloeosporium apocryptum). Severely infected leaves of A. platanoides were received from St. Foy, Quebec Co., Que., where the disease was said to be very prevalent. It was seen in the municipal nursery and several private estates at Montreal (J. E. Jacques).

Coral Spot (Nectria cinnabarina). A trace occurred on A. saccharinum at Kentville, N. S. (C. L. Lockhart).

Tar Spot (Rhytisma punctatum) was light to general on A. macrophyllum at Vancouver, B. C. (H. N. W. Toms). It attacked 50 % of the leaves of two small trees of A. saccharinum at Canaan, Kings Co., N. S. It was later seen on A. pensylvanicum and A. spicatum, but not on A. rubrum on which R. acerinum was present (D. W. Creelman).

AESCULUS - Horsechestnut

Leaf Blight (Guignardia aesculi) was heavy on A. hippocastanum throughout P. E. I. (G. W. Ayres).

AMELANCHIER

Black Leaf Curl (Apiosporina collinsii) affected many shrubs in the North Saanich district, B. C. (W. Jones). Infection was moderate in wild stands at Edmonton, Alta. (T. R. D.)

BETULA - Birch

Die-Back (cause unknown). Planted and native yellow and white birch are rapidly disappearing from all parts of P. E. I. as a result of die-back. Many trees are removed each year in Charlottetown (R. R. Hurst).

CHAMAECYPARIS - Cypress

Die-Back (Cytospora ?pinastri) caused slight damage to C. pisifera at Kentville, N. S. (D. W. Creelman).

Root and Crown Rot (Phytophthora ?lateralis) caused considerable damage to C. lawsoniana in a nursery in the Fraser Valley, B. C. (W. R. Foster)

CORNUS - Dogwood

Crown Rot (Phytophthora cactorum) killed two trees near Victoria, B. C. (W. R. Foster).

CORYLUS - Hazelnut

Catkin Deformation. The trouble reported in P. D. S. 29:95 has been identifie by Dr. Paul Miller, Corvallis, Oregon, as due to the filbert bud mite, Eriophyes avellanae (H. N. W. Toms).

COTONEASTER

Rust (Gymnosporangium clavipes). Pycnia were abundant on fruit, but not leaves, at Morden, Man., on 14 June (A. M. Brown).

Dark Berry (Phytophthora cactorum) was seen in the fall wherever C. horizontalis was found in coastal B. C. (W. R. Foster).

ATAEGUS - Hawthorn

Grey Mould (Botrytis cinerea) attacked 75% of the blossoms of C. oxyacantha Kentville, N.S. (D.W. Creelman).

Leaf Spot (Cercoseptoria crataegi (Ell. & Ev.) Davis). Infection was 75-100% damage moderate on C. macrosperma at Steam Mill and Canard, N.S. W. Creelman) This fungus does not seem to have been reported previously Canada. It is apparently a somewhat variable species. It was described by is and Everhart as Cylindrosporium. Davis stated that Cercosporella mirabilis ck was identical but Dearness claimed that Peck's fungus was Cylindrosporium evispina Dearn. Weiss (P.D.R. 25:108-109. 1941) recognizes Cylindrosporium taegi (W. Va.), C. brevispina (Calif. to Mont. and Wash.) and Cercosporella rabilis (Colo., N.Y., Wis.) (D.B.O. Savile).

Leaf Spot (Entomosporium thuemenii) affected 50% of the leaves of C. acantha at Kentville, N.S. in August. In October var. rosea which had been st severely affected, showed premature defoliation (D.W. Creelman).

Rust (Gymnosporangium clavariaeforme) was heavy on fruit and pedicels of oxyacantha at the Station and in several gardens at Kentville, N.S. (D.W. Creelman).

AXINUS - Ash

Anthracnose (Gloeosporium aridum) caused moderate damage to F. americana Lansdowne, Digby Co., and Noel, Hants Co., N.S. (K.A. Harrison, D.W. eelman). Reported from N.S. as G. irregulare It is doubtful whether the eral small-spored species described on ash are distinct. Most authors treat complex under the name G. aridum, but G. fraxineum Peck is actually the est name (D.B.O. Savile)

Rust (Puccinia sparganioides) caused extremely severe damage to about 40 es of F. americana in an area of one square mile at Hillaton, Kings Co., N.S. W. Creelman).

Variegation (?virus). Variegation and leaf distortion occurred on a small e of F. americana at Kentville N.S. The cause was not definitely determined W. Creelman).

EDITSIA - Honey Locust

Canker (Cucurbitaria elongata (Fr.) Grev.). This organism was associated h a canker on G. triacanthos at Bath, near Napanee, Ont. Reported from Ohio J.D. Diller and R.W. Davidson (U.S.D.A. P.D.R. 34:234-235. 1950) K. Corbett). The fungus is represented from London, Ont., by F. Columb. on Robinia pseudoacacia (I.L. Conners).

GLANS

Crown Gall (Agrobacterium tumefaciens). A light infection on branches of regia was seen at Annapolis Royal, N.S. (D.W. Creelman).

Leaf Spot (Gnomonia leptostyla (Marssonina juglandis) was moderately heavy, sing partial defoliation, on a single walnut (?J. nigra) at Montreal, Que. E. Jacques).

NIPERUS - Juniper

Die-Back (Cytospora ?dubyi assoc.). Infection was 10% on J. sabina at tville, N.S., In March (D.W. Creelman).

Rust (Gymnosporangium spp.). G. clavariaeforme was seen on a few trees in a garden at Courtenay, B.C. (W. Jones). Galls of G. betheli were common on J. scopulorum at Morden, Man., and G. clavipes was moderately heavy on J. communis var. depressa close to infected Cotoneaster (q.v.) (A.M. Brown). G. clavipes and, especially, G. clavariaeforme were common in N.S. on J. communis var depressa. G. clavariaeforme, only, was found on plants in an orchard (J.F. Hockey).

Needle Cast (Lophodermium juniperinum). Infection was a trace on J. commu var. depressa at Kentville, N.S. (J.F. Hockey).

PICEA - Spruce

Rust (Chrysomyxa spp.). A specimen of C. weirii on P. engelmanni, collected in June 1950 at Burton, B.C., was received from A.K. Parker. Needle rusts, apparently mostly C. ledicola and C. empetri, were very heavy at St. Anthony, Nfld., on hillsides kept moist for long periods by sea fog; but genera two or more telial hosts were present and mixed infections often occurred, makin it impossible to assess the importance of individual species exactly. C. ledi var. cassandrae was moderatly heavy on Chamaedaphne, and C. chiogenis and C. ledi var. rhododendri were scarce on Chiogenes hispidula and Rhododendron lapponicu respectively. This is the first report of the latter rust east of Hudson Bay. Of particular interest was the finding of C. woronini at St. Anthony, where it was uncommon on both P glauca and on P. mariana, always in association with telial witches' brooms on Ledum groenlandicum. With the finding of this rust on L. groenlandicum it becomes evident that it is to be expected further south than had been anticipated. It should be sought in humid coast forest regions such as the Queen Charlotte Is. and coastal northern B.C. (D.B.O. Savile).

PINUS - Pine

Root Rot (Armillaria mellea). Rhizomorphs were abundant at the base of a young, dying tree of P. sylvestris at Kentville, N.S. Mycelial mats were present under the bark (J.F. Hockey). Although there are several specimens in the Herbarium taken in association with pines this is our first report of definite infection of P. sylvestris.

Blister Rust (Cronartium ribicola). A single infected tree was found in a stand of young Pinus strobus at the Station, Kentville, N.S. (C.O. Gourley). Occasional infections were seen in Kings Co., P.E.I. (R.R. Hurst).

PLATANUS

Anthracnose (Gnomonia veneta). Leaves of P. occidentalis, with typical lesi bearing the Gloeosporium stage, were collected by W.R. Foster at the Empress Hotel, Victoria, B.C. It was collected at the same site by Dr. H.T. Güssow in 1937 (I.L. Conners). It was heavy on P. occidentalis at Niagara-on-the-Lake, O and was found on young, recently planted trees at Niagara Falls. A much lighter infection, on the leaves but not on the twigs, was later found in a planting of what is almost certainly P. acerifolia, the London plane tree, near Chippawa, on the Niagara River boulevard; this species seems to be much more resistant than the native P. occidentalis (R.W. Sheppard).

PULUS - Poplar

Leaf and Twig Blight (Fusicladium radiosum) was very heavy in Queens Co., E.I. (R.R. Hurst).

Leaf Spot (Marssonina castagnei). Infection was patchy in Alta., being very ıvy on sucker growth of P. tremuloides at Edmonton and Fort Vermilion L. Kennedy, G.B. Sanford).

Rust (Melampsora abietis-canadensis) was very heavy on P. grandidentata at ntville, N.S., and caused much defoliation. It was moderately heavy on tremuloides, causing yellowing and some defoliation (D.W. Creelman).

Twig Blight (?Pseudomonas syringae). A specimen was received from Meadow ke, Sask. (T: C. Vanterpool).

Yellow Leaf Blister (Taphrina aurea) was common on P. nigra at Sidney, B.C. Jones).

Powdery Mildew (Uncinula salicis). Severely infected young trees were seen Mount Royal, Montreal, Que. (J.E. Jacques).

UNUS

Black Knot (Dibotryon morbosum) caused moderate damage to P. padus at otoks, Alta. (A.W. Henry). Traces were seen at Contrecoeur, Vercheres Co., e., on P. virginiana (J.E. Jacques).

Leaf Spot (Gloeosporium serotinum Ell. & Ev.) caused serious shot-holing l defoliation of P. serotina at Kentville, N.S., in early August (C.O. Gourley). t previously reported to the Survey or in the herbarium.

Powdery Mildew (Podosphaera oxyacanthae) was noted on P. virginiana var. nissa at Macalister, B.C. (J. Macalister, W. Jones). It was heavy on this st at Brilliant in the Kootenays (M.F. Welsh).

Brown Rot (Sclerotinia fructicola) was heavy on an ornamental cherry in eens Co., P.E.I. (G.W. Ayres).

Die-Back (Valsa cincta) was light on P. salicina at the Station, Kentville, S. (C.O. Gourley).

ERCUS - Oak

Powdery Mildew (Microsphaera alni). Infection was 10% on Q. borealis at w Minas, N.S., on 4 Nov. (K.A. Harrison).

Leaf Blister (Taphrina coerulescens) was a trace to severe on oaks at nmerside, P.E.I., in late July (R.R. Hurst, D.B. Robinson, I.L. Conners).

AMNUS - Buckthorn

Rust (Puccinia coronata). Pycnia were seen on a small bush of R. alnifolia Morden, Man., on 14 June and aecia were plentiful on 25 June at Riding Mountain. cia were common on R. cathartica at Fort Garry on 12 June. A few aecia on s host at Brandon produced infection on rye, but not oats. A few pycnia were nd on leaves of R. davurica in a hedge at Morden. Some aecia, on the average h only two cups apiece, were found on R. utilis at Brandon after a considerable ırch; the spores infected rye but not oats (A.M. Brown, B. Peturson). B. Cummins (U.S.D.A., P.D.R. Supp. 196:540. 1950) records P. coronata R. utilis in China in 1935, but it is apparently unrecorded as a host in North ıerica (I.L. Conners). Infection was a trace on R. cathartica at Ste-Anne de la catiere, Que. (A. Payette). Only traces of rust were found on R. alnifolia

and R. cathartica in N.B. Traces of P. coronata var. agrostis occurred on R. frangula at Fredericton (J. L. Howatt). R. cathartica was lightly infected at Souris and Summerside, P.E.I. (R.R. Hurst).

SALIX - Willow

Scab (Fusicladium saliciperdum) was severe on the French willows at Grand Pré, N.S., as is usual in years when apple scab is heavy. Ground too wet to support the sprayer during critical periods aggravated the trouble. Infection was 90% by August (K.A. Harrison). Scab was heavy at Bedeque, Charlottetown, and Bay Fortune, P.E.I. (R.R. Hurst).

Anthracnose (Marssonina kriegeriana) caused slight damage to S. babylonica at Sidney, B.C. (J. Bosher, W. Jones).

Blight (Physalospora miyabeana) was heavy at Grand Pré, N.S.; see under Scab (K.A. Harrison). It was heavy at Bedeque, Charlottetown, and Bay Fortune, P.E.I. (R.R. Hurst).

SORBUS - Mountain Ash

Fire Blight (Erwinia amylovora). Infection was moderate in a tree at Lacomb Alta. At Edmonton a large tree near an infected crab apple was severely blighted (L.E. Tyner). A specimen was received from near Oakville, Ont. (E.H. Garrard

TILIA - Basswood

Anthracnose (Gloeosporium tiliae) was heavy on planted trees in Queens and Prince Co., P.E.I. (G.W. Ayres).

TSUGA - Hemlock

Gall (cause unknown). V.J. Nordin (For. Chron. 26:308. 1950) describes a gall of the stems, branches and twigs of T. heterophylla in B.C. It is recorded from Queen Charlotte Is., Cowichan L., Cracoft I. and Vancouver, and in the interior, from Naksup and Blue River. Up to 68% of the understory growth was seen to be affected near Sandspit, Queen Charlotte Is., but timber trees may also be affected. The disease is most abundant in humid situations. The galls appear to originate in the phloem (D.B.O.S.).

ULMUS - Elm

Dutch Elm Disease (Ceratostomella ulmi). In Quebec during 1951, the survey in the outer counties of the infected area was discontinued, and scouting and control work were confined to those cities and towns willing to provide employees who, after instruction by trained personel of the Division of Plant Protection, wou examine the elms within their boundaries. Most of the municipalities on the Islan of Montreal and the cities of Sherbrooke, Drummondville, Victoriaville, St. Hyacinthe, Lennoxville, and Granby were thus surveyed and a total of 551 tree were found to be infected. This brings the total number of infected trees recorded in the province since the discovery of the disease in 1944 to approximately 9000.

In Ontario, the survey was confined to towns and cities and to the main highways of the more heavily settled districts. Table 12 shows the distribution by counties of infected trees since the disease was discovered in 1948 (Ruth Macra

Leaf Spot (Gnomonia ulmea). Some trees of U. americana at Kentville, N.S., ·e heavily infected, but others near by were unaffected. Infection was 25-50% on pumila at Steam Mill and caused much premature defoliation (D. W. Creelman, '. Hockey).

Table 12. Dutch Elm Disease in Ontario

ınty	1948	1950	1951	County	1948	1950	1951
·leton	3	5	13	Lennox & Addington	-	-	1
ıdas	1	-	-	Peel	-	1	3
ɜex	-	91	168	Prescott	5	1	-
ɔntenac	-	1	-	Prince Edward	-	1	1
ngarry	-	2	-	Russell	1	-	-
ɛnville	1	-	-	Stormont	3	-	-
ıt	-	-	2	Welland	-	3	-
ɛds	-	1	1	York	-	-	1
				Totals	14	106	190

Coral Spot (Tubercularia ulmea). Specimens of Chinese elm were received m Lachine, Que., where the disease was stated to be severe (J. E. Jacques). anker on the trunk of a tree of U. pumila 1 1/4 in. diam. was received from ıaventure (R. Campagna, I. L. Conners). Specimens of U. pumila were received m Sydney and Truro, N.S. (J. F. Hockey, I. L. Conners). U. pumila was erely damaged at Kensington, P. E. I. (R. R. Hurst). All the reports that reach of serious damage from coral spot evidently refer to Asiatic elms; but, since reports commonly refer to U. pumila as the Chinese elm, it is generally btful whether the plant involved is U. pumila (Siberian elm) or the rather similar parvifolia (Chinese elm). The above reports are referred to the former species he belief that it is the commoner species in cultivation. It is desirable that nerogamic specimens should accompany diseased twigs in order that the ɔus of the two hosts in relation to the disease can be ascertained (D. B. O. S.).

VI. DISEASES OF ORNAMENTAL PLANTS

ACONITUM

Yellows (Callistephus virus 1) severely affected five plants in a garden at Fredericton, N.B. (D.J. MacLeod).

ALTHAEA - Hollyhock

Rust (Puccinia malvacearum) was seen in most interior sections of B.C., but infection was light owing to a dry season (G.E. Woolliams). Infection was heavy at the Laboratory, Fort Garry, Man. (A.M. Brown). Rust was abundant in easter Ont. and western Que. Extremely heavily rusted specimens were received from Knowlton, Que. The primary lesions were 0.4-0.6 mm. diam., 3-6 mm. apart. The secondary pustules were 0.2-0.4 mm. diam., contiguous to 1.0 mm. apart. From examination under a graticule it was estimated that there were 3.5 pustules per sq. mm. (I.L. Conners). Double varieties were reported to be very severely affected at Ile Perrot and many plants were killed (J.E. Jacques). It was heavy at Charlottetown, P.E.I., and several specimens were sent in (D.B. Robinson).

ANTIRRHINUM - Snapdragon

Blight and Wilt (Botrytis cinerea). A wilting of the leaves from the top downw and cankering at the base of the stem were seen in three greenhouses at Brampton Ont., in March. B. cinerea fruited on the cankers. Damage was slight in two houses and moderate in the third. All three growers had experienced a similar trouble in other years (J.D. Gilpatrick). A light infection occurred in a greenhous at Canard, N.S. (J.F. Hockey).

Rust (Puccinia antirrhini) was fairly extensive in two greenhouses at Brampto Ont., in March (J.D. Gilpatrick).

Wilt (Verticillium albo-atrum) attacked 30% of plants in a garden at Kentville, N.S. Infection apparently originated in the greenhouse in which the plants were started (J.F. Hockey).

Yellows (Callistephus virus 1) was found at the Experimental Station and the Laboratory, Fredericton, N.B. Infection was trace to 3% (D.J. MacLeod).

BEGONIA

Grey Mould (Botrytis cinerea) affected flowers, leaves and stems of tuberous begonias in a garden at Beauharnois, Que. (J.E. Jacques).

Powdery Mildew (?Erysiphe cichoracearum) completely killed the tops of som tuberous begonias at Port Elgin, Ont., in July. Two tuberous begonias in a windo box at Montreal, Que., were severely damaged; adjacent petunias were not attacke These are our first reports of this disease outdoors (H.S. Thompson). A single affected leaf of an elephant-ear begonia was received from Montreal Que., in Feb. 1952 (D.B.O. Savile).

Bacterial Leaf Spot (Xanthomonas begoniae) affected 25% of the plants in a commercial greenhouse at Greenwich, N.S. The plants quickly recovered when ke in a cool, dry atmosphere (J.F. Hockey).

RBERIS - Barberry

Canker (?Dothidella berberidis (Wahl.) Theiss. & Syd.). Affected stems of wilsonae, received from Victoria, B.C., in April 1952, bore immature ctifications apparently of this fungus (I.L. Conners).

Rust (P. graminis). A few mature aecia were seen on B. vulgaris at rrickville, Ont., on 8 June (I.L. Conners). Infection was a trace at Ste. ie de la Pocatiere, Que. (A. Payette). Only traces were found on barberries arious parts of N.B., the lightest infection ever noticed (J.L. Howatt).

LTONIA

Streak (virus) severely damaged 62% of the plants in the border at the Station, edericton, N.B. (D.J. MacLeod)

LENDULA

Mosaic and Streak (Cucumis virus 1) caused a severe mosaic and foliar rosis on two plants in a garden at Fredericton, N.B. (D.J. MacLeod).

Yellows (virus) severely damaged 10% of the plants in a garden in Queens Co., .I. (R.R. Hurst).

LLISTEPHUS - China Aster

Wilt (Fusarium oxysporum f. callistephi). The pathogen was isolated from nts sent in from Creston, B.C. (G.E. Woolliams). Wilt was found in a garden Longueuil, Chambly Co., Que., with a Fusarium associated (J.E. Jacques).

Wilt (Verticillium albo-atrum). The pathogen was isolated from plants on a m at Summerland, B.C., where the disease had been found on several other t plants (G.E. Woolliams).

Yellows (Callistephus virus 1) affected almost all the plants in a garden at ntreal, Que. (J.E Jacques). Infection was trace to 100% in gardens at rlottetown, P.E.I. (R.R. Hurst).

RYSANTHEMUM

Powdery Mildew (Erysiphe cichoracearum) slightly disfigured leaves of plants shaded location at Point Grey, B.C., in late August (H.N.W. Toms). Infection moderate at the Botanical Garden, Montreal, Que., in October, and a trace local greenhouse (J.E. Jacques).

Root Knot (Meloidogyne (Heterodera) sp.) was fairly general in a nursery at nichton, B.C. (J. Bosher).

Stem Rot (Rhizoctonia solani). A scattered infection of greenhouse plants was n in August at Falmouth, N.S. It was most conspicuous in freshly rooted and ply planted cuttings to which peat had been added (J.F. Hockey).

Wilt (Sclerotinia sclerotiorum) attacked 2% of the plants in a garden at couver, B.C. The pathogen was isolated (R. Messum, W. Orchard).

Yellows (Callistephus virus 1), Infection was 100% in a planting of 12 varieties garden at Charlottetown, P.E.I. (R.R. Hurst).

REOPSIS

Yellows (Callistephus virus 1) attacked 2% of the plants in a garden at dericton, N.B. (D.J. MacLeod).

CYCLAMEN

Stunt (Ramularia cyclaminicola). Traces occurred at the Botanical Garden, Montreal, Que., and about 5% in a commercial greenhouse in April (J. E. Jacques

DAHLIA

Crown Gall (Agrobacterium tumefaciens). The pathogen was isolated from gigantic galls found in a garden at Guelph, Ont. All the plants were affected (E. H. Garrard). Infection was 100% on recently imported Carolina Maid and Limelight at Charlottetown, P. E. I. (G. W. Ayers).

Ring Spot (virus) was severe on 2 of 12 plants in a garden at Fort Garry, Man. (W. E. Sackston).

Stunt (virus) severely affected a small planting at the Botanical Garden, Montreal, Que. (J. E. Jacques). Stunt attacked 1% of the plants at the Station, Fredericton, N. B. (D. J. MacLeod).

DAPHNE

Mosaic (?virus). A mottled specimen of D. mezereum was received from Penticton, B. C. (W. R. Foster).

DELPHINIUM

Powdery Mildew (Erysiphe polygoni) affected 3% of 450 plants in a nursery at Whonock, B. C. (I. C. MacSwan). Infection was heavy in several gardens at Charlottetown, P. E. I. (R. R. Hurst).

Bacterial Blight (Pseudomonas delphinii) affected 5% of 450 plants in a nurse at Whonock, B. C. It was most severe on plants shaded by fruit trees (I. C. MacS The pathogen was isolated from specimens brought in from a planting at Calgary, Alta., where infection was general and damage heavy (T. R. D.). A specimen was received from Quebec City, Que. (J. E. Jacques).

DIANTHUS

Wilt and Branch Rot (Fusarium sp.). Wilting and rotting of the branches wer seen on 10% of carnation plants in a greenhouse at Clarkson, Ont., in March. Fusarium sp. was isolated (J. D. Gilpatrick). Wilt (F. oxysporum f. dianthi) affected 10% of carnation cuttings in sterilized soil at Kitchener, Ont. The cuttin were apparently infected before transplanting (H. S. Thompson). Stem Rot (F. avenaceum) affected a specimen sent in from Truro, N. S., the grower claime severe losses (D. W. Creelman, W. L. Gordon).

Rust (Uromyces caryophyllinus) was light but general on flowering carnations in five greenhouse establishments in s. Ont. visited in March. At Concord it was heavy on and caused severe damage to, young rooted cuttings. High humidity seemed to have aggravated the trouble (J. D. Gilpatrick).

Mosaic (carnation mosaic virus). All the plants in eight greenhouses examin in s. Ont. showed symptoms. The virus was transferred from several randomly selected plants to the indicator D. barbatus. Several specimens were also submitted to the laboratory (J. D. Gilpatrick).

Streak (virus) was seen on a few plants in five greenhouses in s. Ont. in Mar Symptoms were most severe on Virginia and mildest on William Sim (J. D. Gilpat

Blindness (boron deficiency) was abundant in a greenhouse near Victoria, B. C. as corrected by the application of borax at 30 lb. per acre (W. R. Foster).

GERON - Fleabane

Yellows (Callistephus virus 1) infected 2% of E. mucronatus in the laboratory ease garden, Fredericton, N. B. (D. J. MacLeod).

LIPENDULA

Powdery Mildew (?Sphaerotheca humuli). A plant very heavily infected with conidial stage was received from Iroquois Point, Ont., in June (I. L. Conners, S. Thompson).

RSYTHIA

Bacterial Blight (Pseudomonas syringae) caused severe damage to F. sp. at tville, N. S. (D. W. Creelman).

ILLARDIA

Yellows (Callistephus virus 1) infected five plants in a garden at Fredericton, B. (D. J. MacLeod). Infection was 100% in a planting of Burgundy in Queens , P. E. I. (R. R. Hurst).

ADIOLUS

Leaf Spot (Alternaria fasciculata Cke. & Ell.). S. A. Simmons (U. S. D. A. D. R. 35:333-334. 1951) describes a leaf spot in Ont. due to this organism, se identity was confirmed by J. W. Groves (H. S. Thompson).

Yellows (Fusarium oxysporum f. gladioli) attacked many varieties near rlottetown, P. E. I., infection being trace to 15%. Many specimens were also t in (R. R. Hurst).

Storage Rot (Penicillium gladioli) was predominant in 15/22 corms submitted m Vernon, B. C., in March 1952. Scab, mechanical injury and inadequate ing had allowed a heavy infection to occur (D. B. O. Savile). Severely infected ms were received from Marieville, Rouville Co., Que. (J. E. Jacques). ction was 10% in one lot of corms at Charlottetown in May (R. R. Hurst).

Scab (Pseudomonas marginata) was heavy on one of three corms received from ssa, Ont., in April 1952 (D. B. O. Savile). In a planting at Ottawa in 1950 corm ction was 79. 6% on Leading Lady and 73. 6% on Spotlight (J. Sibalis). Infection about 15% in the stock of a grower in Montreal, graded in Jan. 1951 (J. E. ques).

Core Rot (Sclerotinia draytoni). Three shrivelled, infected corms received m Montreal, Que., in March 1952 had evidently been inadequately cured B. O. Savile). A planting at Sherbrooke suffered severely from the leaf spot stem rot phases of the disease. Specimens received on 23 Oct. showed severe m rot spreading downward into the corm (J. E. Jacques). This appears to be first definite record of the stem and leaf phases of the disease in Que.

Dry Rot (Sclerotinia gladioli) was present, with Septoria gladioli on two of three ms received from Odessa, Ont., and was heavy on others from Ormstown, Que., April 1952 (D. B. O. Savile). Slightly infected corms were received in November n Marieville, Rouville Co., (J. E. Jacques).

Hard Rot (Septoria gladioli) was present on two of three corms received in April 1952 from Odessa, Ont. It was heavy on corms received from Montreal, Que., in January 1952; pycnidia were forming on corms of several varieties, and in some instances a secondary Fusarium rot was present (D. B. O. Savile).

Mosaic (virus complex). A survey of a commercial planting at St. Catharine Ont., yielded the following percentages of the different varieties with various symptoms: Green mottle: Commando 42.4, Corona 0.4, Harvest Moon 35.9, Kestrel 11.7, Magnolia 0.9, Star Dust 10.2. Yellow mottle: Kestrel 2.2, Rosa v Lima 5.8. Yellow mottle and spot necrosis: Rosa van Lima 0.6. Necrotic spotting: Mrs. Marks' Memory 14.9, Myrna 65.8, Rosa van Lima 32.4. Graying and necrotic spotting: Mighty Monarch 100. Streaking: Kestrel 19.0, Myrna 1.4. Bright chlorotic line pattern: Mrs. Marks' Memory 23.4. Chlorosis: Mrs. Mark Memory 3.4 (G. C. Chamberlain). A faint mottle, due to Phaseolus virus 2, was seen in seven gardens in York, Sunbury and Charlotte Counties, N.B. (D. J. MacLeod).

GODETIA

Yellows (Callistephus virus 1) affected 35% of the plants in the laboratory disease garden, Fredericton, N.B. (D. J. MacLeod).

HEDERA - Ivy

Leaf Spot (Xanthomonas hederae) has been heavy for several years in a greenhouse at London, Ont. Strict sanitation and regulation of watering have give fair control (J. D. Gilpatrick). Infected leaves were sent in from a private reside in Montreal, Que. (J. E. Jacques).

HIPPEASTRUM - Amaryllis

Scorch (Stagonospora curtisii). Traces could be found on almost every bulb, leaf or flower stalk at the Botanical Garden, Montreal, Que., in July. Many flower stalks were so heavily infected that they dried up without flowering. Plant were cleaned up by cutting out diseased tissues and treating with powdered ferbar Thereafter weekly sprays with ferbam controlled the disease (J. E. Jacques).

HYDRANGEA

Powdery Mildew (?Erysiphe cichoracearum). Traces occurred at the Botani Garden, Montreal, Que., in March, and it was severe in two local greenhouses (J. E. Jacques).

IRIS

Bacterial Leaf Blight(Bacterium tardicrescens) caused severe scorching of leaves at the Botanical Garden, Montreal, Que. (J. E. Jacques).

Leaf Spot (Didymellina macrospora). A trace was found in one planting out of 22 inspected for certification on Vancouver I., B. C., but none was seen on the mainland (N. Mayers). A small amount was seen in plantings in most parts of th interior (G. E. Woolliams). Infection was slight at Edmonton, Lacombe and Beaverlodge, Alta. (T. R. D.). Leaf spot was heavy in most gardens at St. Roch, Verchères Co., Que., and traces were recorded at Sorel (J. E. Jacques).

Soft Rot (Erwinia carotovora). Traces occurred in July at the Botanical Gard Montreal, Que., (J. E. Jacques). Two plants in Queens Co., P. E. I., were severely affected (R. R. Hurst).

Mosaic (virus) was found in 18.2% of plantings entered for certification on ncouver I., B.C., and infection ranged from trace to 1%. It was seen in 22.7% mainland plantings, infection averaging 0.7% (N. Mayers).

ATHYRUS

Powdery Mildew (Microsphaera diffusa). Infection was trace to moderate several varieties in Queens Co., P.E.I. (R.R. Hurst).

LIUM - Lily

Blight (Botrytis elliptica) caused moderate damage to Croft lilies in a garden Courtenay, B.C. (W. Jones). Foliage infection was 75% on L. sp. at Round ll, Annapolis Co., N.S. (J.F. Hockey).

OBELIA

Mosaic (Cucumis virus 1) severely affected two plants of L. cardinalis in a rden at Fredericton, N.B. (D.J. MacLeod).

ONICERA - Honeysuckle

Leaf Blight (Glomerularia lonicerae) occurred in hedges at the Botanical Garden, ontreal, Que., and specimens were sent in by a nursery inspector who reported to be general (J.E. Jacques)

Powdery Mildew (Microsphaera alni) was heavy on a climbing honeysuckle at arlottetown, P.E.I. (J.E. Campbell).

AHONIA

Rust (Cumminsiella sanguinea) appeared later on M. aquifolium at Ste. Anne la Pocatière, Que., and caused negligable damage (A. Payette). A shipment 25 bushes of M. aquifolium from Holland intercepted at Toronto, Ont., in April 52, was extremely heavily infected and had to be condemned. It seems impractical nurserymen to secure this plant from western Europe, where the rust is general, ther than from eastern North America where the disease is practically absent. is clear that the infection at Ste. Anne de la Pocatière arose from imported stock d continuation of the practice can only lead to complete dispersal of the disease st of the Rockies (D.B.O.S., I.L.C.).

ATTHIOLA - Stock

Grey Mould (Botrytis cinerea). A few lesioned leaves were received from a eenhouse at Hudson, Que., in April (I.L. Conners).

Stem Rot (Rhizoctonia solani). Infection was 10% in a planting of well-grown n Weeks stocks at Charlottetown, P.E.I., in July (R.R. Hurst).

ENTHA - Mint

Downy Mildew (Peronospora stigmaticola). As already noted (Mycologia 43: 3-114. 1951) this remarkable species has been found on stigmas of M. arvensis om Ont. and P.E.I. Dr. H.C. Greene (in litt.) reports it on herbarium specimens om Wisconsin. It may be widespread but is extremely inconspicuous and should sought for carefully, especially in humid areas. It probably greatly reduces ed set under suitable conditions. More data are needed on host and geographic nge (D.B.O. Savile).

Rust (Puccinia menthae) was general on M. spicata in two gardens at North Saanich, B.C. (W. Jones).

MYOSOTIS - Forget-me-not

Grey Mould (Botrytis cinerea) attacked stems and petals of M. sp. in a greer house at Brampton, Ont., in March, causing 50% loss. The house had been kept at 60°F. with high humidity (J. D. Gilpatrick).

NARCISSUS

Basal Rot (Fusarium spp.). Less than 1% was seen in a commercial stock on Vancouver I., B.C., and a trace to 2% in some stocks on the mainland during bulb inspection (N. Mayers).

Smoulder (Sclerotinia narcissicola) was not found in recordable amounts on Vancouver I, B.C., during inspection of plantings for certification; it occurred in 13.2% of mainland plantings, incidence averaging 1.6% (N. Mayers).

Scorch (Stagonospora curtisii) was negligable on Vancouver I., B.C. Prima lesions were noted in 76% of mainland plantings inspected and averaged 1.5%, but there was no spread owing to dry weather (N. Mayers).

Decline (virus) was seen in every King Alfred planting inspected on Vancouve B.C. Infection was less than 2.5% in 58% of plantings, and the maximum was 6% On the lower mainland no decline could be seen on the first inspection, but it was found in 77%, incidence ranging from 0.5 to 8.0%, on the second inspection. As in 1950 more infected plants showed up after the second inspection (N. Mayers).

Mosaic (virus). Of the plantings inspected on Vancouver I., B.C., 50% were free, 33% carried 0.25-0.5% and 17% carried over 0.5% infection. On the mainland mosaic was found in 25% of plantings and averaged 0.39% infection, les than half the amount found in 1950; early roguing is responsible for the decrease (N. Mayers).

PAEONIA - Peony

Blight (Botrytis paeoniae). Infection was moderate in a planting at Calgary, Alta. (T.R.D.). Damage was very heavy in a commercial planting at Charlotteto P.E.I., and four cases were reported from Prince and Kings Co. (R.R. Hurst).

Mosaic (virus). A trace was seen in a garden at Edmonton, Alta. (T.R.D.). A specimen was received from Oakville, Ont. (G.C. Chamberlain).

Ring Spot (virus). Symptoms were severe on 2% of the plants at the Station, Fredericton, N.B. (D.J. MacLeod).

Blossom Blight (cause unknown) was common in gardens at Saskatoon, Sask., and was reported by D. Robinson, Extension Dept., to be common in the province An enquiry was also received from Tisdale (T.C. Vanterpool). Similar troubles have previously been reported from Alta., Sask., and P.E.I. (P.D.S. 16:80, 23:114, and 29:109). Probably partly environmental, but not necessarily all due to the same cause. See also under Frost Injury.

Chlorosis (lime-induced iron deficiency). What seemed to be this trouble was seen for the first time in Sask. It is common on certain soils in roses, raspberries, mountain ash, etc. (R.J.L.).

Frost Injury. Throughout the Okanagan Valley, B.C., many peony buds faile to develop beyond 1/4 in. diam. No pathogen could be isolated. On the night of 19 April a minimum of 14°F. was registered at Summerland, and it was correspondingly cold in other sections. This low temperature is thought to have injured the buds (G.E. Woolliams). See also Blossom Blight.

.PAVER - Poppy

Boron Deficiency was severe on a plant at Charlottetown, P. E. I. See E. andenburg (R. A. M. 21:471. 1943) (R. R. Hurst).

.RTHENOCISSUS

Powdery Mildew (Uncinula necator) was heavy on P. quinquefolia at Kentville, S. (D. W. Creelman).

:LARGONIUM - Geranium

Grey Mould (Botrytis cinerea) attacked blossoms and large areas of leaves Montreal, Que., in late August (J. E. Jacques). It was severe on leaves, duncles, petioles and stems at Ste. Anne de la Pocatiere, Que., in September. fection often originated from an adherent petal (A. Payette).

Mosaic (virus) affected one plant in a garden at Fredericton, N. B. (D. J. MacLeod).

:TUNIA

Stem Rot (Sclerotinia sclerotiorum) killed the upper portions of plants at tawa, Ont., in July. No lesions were present at soil level. Previously reported om Alta. and Que. (H. S. Thompson).

Root Rot (Thielaviopsis basicola) attacked 10% of plants in a garden at Ottawa, t., in early July. The roots and stem bases were discoloured. Infection idently started in the greenhouse flats (H. S. Thompson). James Johnson (Jour. r. Res. 7:289-300. 1916) showed experimentally that petunia is slightly sceptible to the organism (I. L. C.).

Yellows (Callistephus virus 1). Infection was trace to 5% at the Station, edericton, N. B. (D. J. MacLeod).

HILADELPHUS - Mock Orange

Bacterial Blight (Pseudomonas syringae) caused severe damage at Kentville, S. (D. W. Creelman). First report to the Survey.

HILODENDRON

Leaf Spot (Phyllosticta sp.). Leaves received from Montreal, Que., in June re a Phyllosticta with spores 2.3-4.6 x 0.8-1.5 microns (H. S. Thompson). ssibly a microconidial stage of some leaf-spotting pathogen. There seems to be record of a Phyllosticta on this host.

HLOX

Powdery Mildew (Erysiphe cichoracearum) was heavy on all plants of P. niculata in a garden at Vancouver, B. C. (H. N. W. Toms). It was heavy on plants Outremont, Que. (J. E. Jacques). Infection was light on phlox in Queens Co., E. I. (R. R. Hurst).

Leaf Spot (Septoria divaricata) caused slight damage in Kings and Queens unties, P. E. I. (J. E. Campbell).

Blight (virus). Eleven plants of P. paniculata showed severe streaking in a rder at the Station, Fredericton, N. B. (D. J. MacLeod). One severely affected mp was seen at Charlottetown, P. E. I. (R. R. Hurst).

Yellows (Callistephus virus 1). One clump of P. maculata was infected at the Botanical Garden, Montreal, Que. (J. E. Jacques). Three per cent of P. drummondii in a border at the Station, Fredericton, were severely affected (D. J. MacLeod).

RHODODENDRON

Red Leaf (Exobasidium vaccinii) was seen on R. japonicum in a nursery on L I., B. C. (W. Jones). Specimens of azalea were received from a greenhouse at Mount Pleasant, Ont., in January, 1952 (I. L. Conners).

Angular Leaf Spot (Septoria azaleae Vogl. ex Sacc. & Syd.). Azaleas, var. Princess Beatrix, imported in Oct. 1951, from Belgium, were apparently healthy at that time; but when inspected in December by the Plant Protection Division in a greenhouse at Leamington, Ont., the fungus was fruiting freely on the leaves of 25 plants (size of shipment unstated). Weiss (Index Pl. Dis. in the U. S. II:36 sta that the disease is widespread; it may be of general distribution, but there are few authentic reports. In the present material pycnidia are epiphyllous and spore elongate, rounded or sometimes narrowed at ends, septa 0-4, mostly 3, 14. 3-25 x 2. 0-2. 5 microns (I. L. Conners).

ROSA - Rose

Crown Gall (Agrobacterium tumefaciens) caused heavy damage to Dorothy Perkins at Charlottetown, P. E. I., and other specimens were brought in (R. R. Hu

Graft Canker (Coniothyrium sp.) affected at least 10% of the grafts of Happin on R. noisettiana in a commercial greenhouse at Brampton, Ont. A Coniothyrium close to C. fuckelii, was isolated (J. D. Gilpatrick).

Black Spot (Diplocarpon rosae) was very heavy on hybrid teas and hybrid polyanthas in the vicinity of St. Catharines, Ont., and caused complete defoliation by mid-August in some gardens. It was also prevalent in the rose gardens in Victoria Park, Niagara Falls. Severely spotted leaves were received in October from Frankford (G. C. Chamberlain). Specimens were received from private gar at Montreal, Que., and traces were seen at the Botanical Garden (J. E. Jacques). Infection was trace to moderate on several varieties in gardens at Charlottetown, P. E. I. (R. R. Hurst).

Leaf Spot (Mycosphaerella rosicola). Heavily infected leaves were sent in from Ste. Rose, Laval Co., Que., in late July (J. E. Jacques).

Rust (Phragmidium sp.). A trace occurred at Charlottetown, P. E. I. (J. E. Campbell).

Anthracnose (Sphaceloma rosarum) is reported from London, Ont., by Jenki and Dearness (U. S. D. A., P. D. R. 35:460. 1951).

Powdery Mildew (Sphaerotheca pannosa). Heavily infected specimens were received from St. Damase, St. Hyacinthe Co., Que., (J. E. Jacques). It was heavy on rambler roses at Charlottetown, P. E. I., and several specimens were received (R. R. Hurst).

Chlorosis (cause unknown) followed by leaf drop occurred in late winter in th grafting frames of a grower at Brampton, Ont. The scions were severely affecte but produced healthy new growth soon after removal from the frames. All the st were found to have brown, often rotted, roots from which Fusarium sp. was consistently isolated. The development of brown roots in controls as well as inocula plants left the pathogenicity of the fungus in doubt; and it is uncertain whether the condition of the roots were responsible for the chlorosis (J. D. Gilpatrick).

RINGA - Lilac

Powdery Mildew (Microsphaera alni). Heavily infected specimens were ceived from Ville Lasalle, Que., and it was also reported from Longueuil, Lambert, Joliette and Sherbrooke (J. E. Jacques).

Bacterial Blight (Pseudomonas syringae) caused slight damage in a garden at ngley, B. C. (T. Anstey, W. Jones). It was severe on white lilacs, but light others at Kentville, N. S. It was common in the Annapolis Valley and specimens re also received from Halifax and Lunenburg Counties (J. F. Hockey).

AGETES - Marigold

Yellows (Callistephus virus 1) was general in gardens at Fredericton, N. B.; fection ranged from trace to 7% (D. J. MacLeod).

JLIPA - Tulip

Fire (Botrytis tulipae). In plantings inspected for certification on Vancouver , B. C., fire was very light in 21% of plantings on the lower mainland, and oderate to severe in 79%. One grower mulched some plots with sawdust (mainly der and poplar) during the winter, to a depth of 4 in. The sawdust finally mpacted to about 2 in. Wet weather from 11 to 14 May provided ideal conditions r the initiation of severe secondary lesions some of which girdled the flower alk. Spread was very rapid in all but the mulched plots. The surface of the ulch was generally dry except immediately after rain, and may have caused e foliage of mulched plants to dry out fast after rain. It is also possible that ere is less splashing from sawdust than from soil. Furthermore, varieties th dropping leaves tend to harbour more fire than those with erect leaves; and is probable that contact with the mulch is less likely to favour infection than ntact with soil. The mulch had been applied to control weeds and conserve oisture. Such a mulch introduces problems because it may fail to break down pidly when ploughed in, thus trying up soil nitrogen and water. It may be visable to add nitrogen to offset the nitrogen starvation and to hasten breakdown. ie mulched bulbs also flower 7-10 days later than those without mulch (N. Mayers).

Fire was quite prevalent at the Botanical Garden, Montreal, Que., and was ported to be severe in Quebec City (J. E. Jacques). B. aff. tulipae destroyed l the plants in an area 4 x 4 ft. in a bed at Westmount, Que. The severe damage ggested Sclerotinia sativa, once before recorded from Westmount (P. D. S. 18: 0), but it appears to be a strain of B. tulipae. Soil conditions may have enhanced e damage (F. L. Drayton, J. Sibalis). Fire was quite general in N. S., over % of the plants being affected in some untended plantings (J. F. Hockey). fection was heavy and damage severe in several thousand bulbs in Queens Co., E. I., dug in October for transfer to a new site because fire had been heavy ring bloom (R. R. Hurst). The bulbs should, of course, have been dug as soon the leaves started to turn yellow, perhaps late June. Then, if the blossom heads d been removed before the petals fell, a high proportion of bulbs might have been lvaged (D. B. O. S.).

Break (virus). Only traces were observed in plantings inspected on Vancouver , and the lower mainland, B. C. (N. Mayers).

ERBENA

Wilt (cause undetermined) attacked 20% of a planting at Ottawa, Ont. The stem ses were darkened and the lower leaves yellow (H. S. Thompson).

VINCA - Periwinkle

Yellows (Callistephus virus 1) severely affected 3 plants of V. rosea at the Laboratory, Fredericton, N.B. (D. J. MacLeod).

VIOLA

Leaf Spot (Cercospora violae). Specimens of V. cornuta were received from Sarnia, Ont. (I. L. Conners).

Crown and Stem Rot (Myrothecium roseum) caused the eventual death of 20% of a seed planting of V. tricolor var. hortensis at Keating, B. C. (W. Jones).

Powdery Mildew (Sphaerotheca humuli) was abundant on V. tricolor var. hortensis at Keating, B. C. (W. Jones).

ZINNIA

Grey Mould (Botrytis cinerea) was severe at Ste. Anne de la Pocatière, Que. Infection spread from blossoms to leaves and stems, involving the entire plant (A. Payette).

Mosaic (virus) affected a few plants in a private garden at Montreal, Que. (J. E. Jacques).

Yellows (Callistephus virus 1). Trace to 1% infection was seen in two gardens in Sunbury Co., N.B. (D. J. MacLeod).

INDEX OF HOSTS